

**COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Valley Regional Office**

STATEMENT OF LEGAL AND FACTUAL BASIS

Aladdin Manufacturing Corporation
Rockbridge County, Virginia
Permit No. VRO80269

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Aladdin Manufacturing Corporation has applied for a Title V Operating Permit for its Glasgow, Virginia facility. The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit
Contact:



Date: June 27, 2017

Jeremy Funkhouser
540-574-7820

Air Permit Manager:



Date: June 29, 2017

Janardan R. Pandey, P.E.

FACILITY INFORMATION

Permittee

Aladdin Manufacturing Corporation
404 Anderson Street
Glasgow, Virginia 24555-2801

Facility

Aladdin Manufacturing Corporation
404 Anderson Street
Glasgow, Virginia 24555-2801

SOURCE DESCRIPTION

NAICS Code: 314110 – Carpet and Rug Mills

Aladdin Manufacturing Corporation operates a nylon carpet manufacturing facility in Glasgow, Virginia. Activities at the facility include fuel burning, yarn dyeing, yarn processing, and carpet backing. Ancillary equipment and operations to support the carpet manufacturing production process include storage silos and feed hoppers, storage tanks, and mixing operations

The facility is a Title V major source of nitrogen dioxide (NO_x) and volatile organic compounds (VOC). The facility is a synthetic minor source for Prevention of Significant Deterioration (PSD). The facility is a True Minor source for Hazardous Air Pollutants (HAPs); see Attachment I for the Potential to Emit calculations.

This source is located in an attainment area for all pollutants located approximately two kilometers from the James Riverface Wilderness Area, a federally designated Class I area. The facility is currently permitted under the following minor New Source Review and State Operating Permits:

Minor NSR Permits

- July 1, 2008, as amended October 22, 2009, and August 8, 2013: operate four Superba dye lines (SL1 – SL4).
- July 30, 2009: Calcium carbonate storage silo (VAES) and calcium carbonate mixer (VAEM)
- July 13, 2011: PVC Carpet Backing Line (PVC1), PVC silo (PVCS-C1), PVC filler silo (PVCS-C2), and support equipment
- March 27, 2006: R & D Sample Hot Melt Extruder
- August 4, 2016: Tile extruder lines and support equipment
- March 24, 2011 as amended March 18, 2015: Latex pre-coat range (LPCR-1)

State Operating Permit

- December 2, 2009, as amended March 19, 2012 and August 6, 2013

COMPLIANCE STATUS

A full compliance evaluation of this facility, including a site visit, was conducted on October 7, 2014. In addition, all reports and other data required by permit conditions or regulations, which are submitted to DEQ, are evaluated for compliance. Based on these compliance evaluations, the facility has not been found to be in violation of any state or federal applicable requirements at this time.

CHANGES AT FACILITY DURING CURRENT PERMIT TERM

During the current permit term the Title V permit was amended twice, most recently on October 20, 2016. There have been no changes at the facility since the most recent Title V amendment.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following :

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity *	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Fuel Burning Equipment							
B5	B5	Babcock and Wilcox Boiler (installed before 1972)	120 MMBtu/hr	-	-	-	12/2/09, as Amended 3/19/12 and 8/6/13
B6	B6	Babcock and Wilcox Boiler (installed before 1972)	72 MMBtu/hr	-	-	-	12/2/09, as Amended 3/19/12 and 8/6/13
Yarn Dye Lines							
SL1	SYD1-BV, SYD1-PDV, SYD1-WBV, SYD1-FDV	American Superba Dye Line #1	300 lbs yarn/hr	--	--	--	7/1/08 as amended 10/22/09 and 8/8/2013
SL2	SYD2-BV SYD2-PDV, SYD2-WBV SYD2-FDV	American Superba Dye Line #2	300 lbs yarn/hr	--	--	--	7/1/08 as amended 10/22/09 and 8/8/2013
SL3	SYD3-BV, SYD3-PDV, SYD3-WBV, SYD3-FDV	American Superba Dye Line #3	300 lbs yarn/hr	--	--	--	7/1/08 as amended 10/22/09 and 8/8/2013
SL4	SYD4-BV SYD4-PDV, SYD4-WBV SYD4-FDV	American Superba Dye Line #4	300 lbs yarn/hr	--	--	--	7/1/08 as amended 10/22/09 and 8/8/2013

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity *	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
BL1	BL1	Belmont Dye Line	300 lbs yarn/hr	--	--	--	--
--	--	Dye Mixers	--	--	--	--	--
Carpet Backing Lines							
LCS	LCS	Latex Calcium Carbonate Filler Silo (constructed before 1972)	60,000 lbs/hr	Fabric Filter	LCS	PM/PM-10	-
SBRM		SBR Latex Mixer (constructed before 1972)	-				
VAES	VAES	VAE Latex Filler Silo	130,000 lbs/hr; 9,611 TPY	Ultra Industries Fabric Filter Model #CBVC 7-36-11	VAES	PM/PM-10	7/30/09
VAEM		VAE Latex Mixer	-				
PVC1	PVC1	PVC Carpet Backing Line	2,400 yd ² /hr	Ceco Twin Pack Fiber Bed (Coalescing Filter)	PVC1	PM/PM-10	7/13/11
PVCS-C1	PVCS-C1	PVC Silo	60,000 lbs/hr; 42,000 TPY	Ultra Industries Fabric Filter by IMH	PVCS-C1	PM/PM-10	7/13/11
PVCS-C2	PVCS-C2	Filler Silo #2	40,000 lbs/hr	Fabric Filter	PVCS-C2	PM/PM-10	7/13/11
	PVCS-FH	PVC Filler Feed Hopper	10,000 lbs/hr		PVCS-FH		
HME-S	HME-S	R & D Sample Hot Melt Extruder	1,000 lbs/hr	-	-	-	3/27/06
TE1-MC	TE1-MC	Tile Extruders	12,800 lbs/hr	--	--	--	4/28/06 as amended 8/4/16
TE1-RTD1	TE1-RTD1	Tile Line Extruder Pellet Receiver Tank 1	45,000 lbs/hr	Fabric Filter	TE1-RTD1	PM/PM-10	4/28/06 as amended 8/4/16
TE1-RTD2	TE1-RTD2	Tile Line Extruder Pellet Receiver Tank 2	45,000 lbs/hr	Fabric Filter	TE1-RTD2	PM/PM-10	4/28/06 as amended 8/4/16

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity *	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
TE1-RTD3	TE1-RTD3	Tile Line Extruder Pellet Receiver Tank 3	7,000 lbs/hr	Fabric Filter	TE1-RTD3	PM/PM-10	4/28/06 as amended 8/4/16
TE1-RTD4	TE1-RTD4	Tile Line Extruder Pellet Receiver Tank 4	10,000 lbs/hr	Fabric Filter	TE1-RTD4	PM/PM-10	4/28/06 as amended 8/4/16
Pellet 4	Pellet 4	Pellet 4 Storage Silo	110 tons	Fabric Filter	Pellet 4	PM/PM-10	4/28/06 as amended 8/4/16
Pellet 5	Pellet 5	Pellet 5 Storage Silo	110 tons	Fabric Filter	Pellet 5	PM/PM-10	4/28/06 as amended 8/4/16
Pellet 6	Pellet6	Pellet 6 Storage Silo	110 tons	Fabric Filter	Pellet 6	PM/PM-10	4/28/06 as amended 8/4/16
TE1-T1	TE1-T1	Trial Pellet Receiver Tank 1	3,000 lbs/hr	Fabric Filter	TE1-T1	PM/PM-10	4/28/06 as amended 8/4/16
TE1-T2	TE1-T2	Trial Pellet Receiver Tank 2	6,000 lbs/hr	Fabric Filter	TE1-T2	PM/PM-10	4/28/06 as amended 8/4/16
LPCR-1	OV-1, OV-2, OV-3, OV-4, OV-5	Latex Pre-Coat Range	5,000 yd ² /hr	--	--	--	3/24/11
Miscellaneous							
PW	--	Non-aqueous Parts Washer	--	--	--	--	--
WWTP	--	Wastewater Treatment Plant	--	--	--	--	--
SLD	--	Self Lock Dryer	1.5 Million Btu/hr	--	--	--	--

*The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement.

EMISSIONS INVENTORY

A copy of the 2016 annual emission update is included as Attachment A. Emissions are summarized in the following tables.

2016 Actual Facility-wide Criteria Pollutant Emissions

Pollutant	PM-10	PM-2.5	SO₂	NO_x	CO	VOC
	tons/yr					
Emissions - 2016	2.147	2.118	0.08	19.892	11.25	15.934

2016 Facility-wide Hazardous Air Pollutant Emissions

Pollutant	Tons/yr
Vinyl Acetate (VA)	0.0
Vinyl Chloride	0.003381
Maleic Anyhdride	0.4947

EMISSION UNIT APPLICABLE REQUIREMENTS

Fuel Burning Equipment (B5 and B6)

Limitations:

The following limitations are state BACT requirements from the SOP issued on 12/2/09, as amended 3/19/12 and 8/6/13. The following limitations are specific boilers B5 and B6. Please note that the condition numbers are from the State Operating Permit. A copy of the permit is enclosed in Attachment B.

- Condition 3: Boiler emissions shall be controlled through proper operation and maintenance. Boiler operators shall be trained in the proper operation of all such equipment. Training shall consist of a review and familiarization with the manufacturer's operating instructions, at minimum.
- Condition 4: The approved fuels for Boilers B5 and B6 are natural gas and distillate oil.
- Condition 5: Specifications for distillate oil to be burned in the boilers (B5 and B6). The maximum sulfur content per shipment is set at 0.05 percent.
- Condition 6: The condition establishes fuel throughputs for natural gas and distillate oil for each boiler B5 and B6.
- Condition 8: The condition establishes the hourly and annual emission limits for boiler B5.
- Condition 9: The condition establishes the hourly and annual emission limits for boiler B6.

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

- 9 VAC 5-40-900, Existing Source Standard for Particulate Matter (PM) (ACQR 1-6)
- 9 VAC 5-40-930, Existing Source Standard for Sulfur Dioxide (SO₂) (ACQR 1-6)
- 9 VAC 5-40-940, Existing Source Standard for Visible Emissions

Boilers B5 and B6 are each subject to more stringent standards for PM and SO₂ in the SOP as detailed above. A limitation on the visible emissions from boiler B5 and B6 has been established in the Title V permit in accordance with 9 VAC 5-40-940.

In addition to the requirements from the SOP, discussed above, boilers B5 and B6 are subject to the requirements of *40 CFR 63, Subpart JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*. The following

limitations are established in the Title V permit; condition numbers refer to the Title V permit:

- Condition 8: For each boiler (B5 and B6), the permittee shall comply with the applicable standards in 40 CFR 63.11201, and with each work practice standard, emission reduction measure, and management practice specified in Table 2 to 40 CFR 63, Subpart JJJJJJ. The permittee must conduct an initial tune-up of each boiler as specified in 40 CFR 63.11214 and conduct a tune-up of each boiler biennially as specified in 40 CFR 63.11223.
- Condition 9: For each boiler (B5 and B6), the permittee shall comply with the applicable requirements of the General Provisions of 40 CFR 63 Subpart A, as outlined in Table 8 to 40 CFR 63, Subpart JJJJJJ.
- Condition 10: For each boiler (B5 and B6), the permittee shall comply with the applicable general compliance requirements in 40 CFR 63.11205. At all times the permittee shall operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.
- Condition 11: The condition establishes the tune-up requirements for each boiler (B5 and B6).

The one-time energy assessment required under §63.11201 and Table 2 to 40 CFR 63 Subpart JJJJJJ, was conducted in June 2013, and reported in January 2014. The requirements for the one-time energy assessment are not included in the Title V permit.

Monitoring and Recordkeeping:

The following monitoring and recordkeeping requirements are from the SOP issued on 12/2/09, as amended 3/19/12 and 8/6/13; the requirements refer to boilers B5 and B6:

- Condition 7: To show compliance with the fuel specifications and fuel throughput limitations, the facility is required to obtain fuel certifications for each shipment of distillate oil. The condition outlines the requirements of the fuel certification.
- Condition 3: The facility must keep records of the required boiler operation and maintenance training, including a statement of time, place and nature of the training provided. In addition, the facility must have available good written operating procedures and a maintenance schedule for the boilers. The procedures shall be based on the manufacturer's recommendations, at a minimum. All records required shall be kept on site and be made available for inspection by the DEQ.

Condition 10: In order to demonstrate compliance with the emission limits contained in the permit, the facility is required to keep records of: the monthly and annual natural gas and distillate oil usage for each boiler; all fuel supplier certifications; and written operating procedures, maintenance and training records, and results of all stack tests and performance evaluations.

In addition to the monitoring and recordkeeping requirements are from the SOP, Condition 8 of the Title V permit requires the facility to conduct weekly inspections of each stack (B5 and B6) to determine the presence of visible emissions. If during the inspection, visible emissions are observed, an EPA Method 9 (40 CFR Part 60, Appendix A) visible emissions evaluation (VEE) shall be conducted. The requirement to conduct visible emission observations satisfies the periodic monitoring requirement establishing compliance with visible emission limitation. Condition 9 of the Title V permit requires the facility to take corrective actions if the VEE indicates the visible emissions exceed the visible emission limitation.

The hourly emission limits established for boiler B5 and B6, for all criteria pollutants (particulate matter, SO₂, NO_x, CO and VOC) are based on the rated capacities and rated hourly fuel consumption of each boiler. The following equation and emissions factors will be used to determine actual emissions from the operation of each boiler B5 and B6:

$$E = F \times N$$

Where:

- E = emission rate (lb/time period)
- F = pollutant specific emission factor, provided below
- N = fuel consumed (million ft³/time period for natural gas and 1000 gal/time period for distillate oil)

Natural Gas Emission Factors – Boilers B5 and B6

Pollutant	Emission Factor		Source of DEQ Factor
	Boiler B5	Boiler B6	
PM (lbs/mmcf)	1.9	1.9	AP-42 Table 1.4-2 (filterable)
PM10 (lbs/mmcf) ^a	7.6	7.6	AP-42 Table 1.4-2 (filterable and condensable)
PM2.5 (lbs/mmcf) ^a	7.6	7.6	AP-42 Table 1.4-2 (filterable and condensable)
SO ₂ (lbs/mmcf)	0.6	0.6	AP-42 Table 1.4-2
NO _x (lbs/mmcf)	280	100	AP-42 Table 1.4-1
CO (lbs/mmcf)	84	84	AP-42 Table 1.4-1
VOC (lbs/mmcf)	5.5	5.5	AP-42 Table 1.4-2

^(a) PM10/PM2.5 emission factors include total condensable and filterable particulate matter

Distillate Oil Emission Factors – Boilers B5 and B6

Pollutant	Emission Factor		Source of DEQ Factor
	Boiler B5	Boiler B6	
PM (lbs/1000gal)	2	2	AP-42 Table 1.3-1 (filterable)
PM10 (lbs/1000gal) ^b	2.3	2.3	AP-42 Table 1.3-2 (filterable) and AP-42 Table 1.3-7 (condensable)
PM2.5 (lbs/1000gal) ^b	1.55	1.55	AP-42 Table 1.3-2 (filterable) and AP-42 Table 1.3-7 (condensable)
SO ₂ (lbs/1000gal) ^a	7.1	7.1	AP-42 Table 1.3-1 at Max Sulfur Indicated
NO _x (lbs/1000gal)	24	20	AP-42 Table 1.3-1
CO (lbs/1000gal)	5	5	AP-42 Table 1.3-1
VOC (lbs/1000gal)	0.2	0.2	AP-42 Table 1.3-3

^(a) SO₂ emission factor is based on average sulfur content of oil burned.

^(b) PM10/PM2.5 emission factors include total condensable and filterable particulate matter

When firing natural gas, hourly emissions for particulate, SO₂, CO and VOC are based on AP-42, Chapter 1.4, *Natural Gas Combustion* (September 1998). Hourly emissions of criteria pollutants (particulate, SO₂, CO and VOC) when firing on distillate oil are based on the emission factors from AP-42, Chapter 1.3, *Fuel Oil Combustion* (September 1998). Short-term emission limits for SO₂ are based on the maximum allowable sulfur content of 0.05 percent, as established in Condition 5 of the SOP dated 12/2/09, as amended 3/19/12 and 8/6/13.

Uncontrolled SO_x emissions are almost entirely dependent on the sulfur content of the fuel and are not affected by boiler size, burner design, or grade of fuel being fired. On average, more than 95 percent of the fuel sulfur is converted to SO₂. Continuous compliance with the SO₂ emission limitations are reasonable demonstrated through the fuel throughput limitations and associated recordkeeping, as well as the fuel certifications showing the distillate oil fuel sulfur content, and the associated recordkeeping.

Continuous compliance with the PM, PM-10, and PM-2.5 emission limitations is reasonably demonstrated through fuel throughput limitations and associated recordkeeping, as well as the visible emission evaluations discussed above, and the associate recordkeeping.

Continuous compliance with the VOC emission limitations is reasonably demonstrated through fuel throughput limitations and associated recordkeeping.

Continuous compliance with the NO_x and CO emission limitations is reasonably demonstrated through fuel throughput limitations and associated recordkeeping, as well as through stack testing, as discussed in the testing section below. The facility is required to keep records of the results of all stack tests and performance evaluations.

Annual emissions for each boiler are calculated based on the maximum fuel throughput contained in the SOP. Condition 6 of the SOP (dated 12/2/09, as amended 3/19/12 and 8/6/13) limits the total fuel throughput for each boiler. Boiler B5 is limited to 4,347,826 gallons of

distillate oil per year, while boiler B6 is limited to 2,608,696 gallons of distillate oil per year; there is no limit on the throughput of natural gas for either boiler. Recordkeeping demonstrating compliance with the fuel throughput limits provides reasonable assurance of compliance with the annual criteria pollutant emission limits, satisfying the periodic monitoring requirement. The facility will also be required to keep records of the DEQ-approved, pollutant-specific emission factors and the equations for calculating emissions.

In addition to the monitoring and recordkeeping requirements from the SOP issued on 12/2/09, as amended 3/19/12 and 8/6/13, the following recordkeeping requirement is established for the boilers (B5 and B6) in accordance with the Area Source Boiler MACT. The condition number below refers to the Title V permit:

Condition 17: The condition establishes the recordkeeping requirements for compliance with the Area Source Boiler MACT.

The recordkeeping established in 40 CFR 63 Subpart JJJJJ for Boilers B5 and B6 provide a means of demonstrating continued compliance with the MACT Subpart JJJJJ limitations.

Testing:

The permit requires source testing for particulate matter on Boilers B5 and B6 in the event of failure of the VEE. Additionally, the DEQ and the EPA have the authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Condition 19 of the Title V permit requires the facility to conduct stack testing for each boiler (B5 and B6) to demonstrate compliance with the short-term NO_x and CO emission limitations established in the permit. The testing is required once per permit term.

Natural gas was selected for NO_x and CO for Boiler 5 since that fuel results in the highest NO_x and CO emissions for the boiler, which is the basis for each short-term (lb/hr) emission limitations contained in the permit.

Distillate oil was selected for NO_x for Boiler 6 since that fuel results in the highest NO_x emissions for the boiler, which is the basis for the short-term (lb/hr) emission limitations contained in the permit.

Natural gas was selected for CO for Boiler 6 since that fuel results in the highest CO emissions for the boiler, which is the basis for the short-term (lb/hr) emission limitations contained in the permit.

The once-per-term stack testing provides a means of demonstrating continuous compliance with the NO_x and CO emission limitations established in the permit.

Reporting:

The following reporting requirements are established for the boilers (B5 and B6) in accordance

with the Area Source Boiler MACT. The condition number below refers to the Title V permit:

Condition 20: The condition establishes the annual reporting requirements for boiler B5 and B6.

Compliance Assurance Monitoring (CAM) Applicability:

Boilers B5 and B6 are natural gas and distillate oil boilers. Boiler B6 does not meet the criteria for 40 CFR Part 64 Compliance Assurance Monitoring (CAM) applicability (40 CFR §64.2(a)(3)) because pre-control PTE for all criteria pollutants for the boiler are under the Title V major threshold of 100 tons per year. Boiler B5 does not meet the criteria for 40 CFR Part 64 CAM applicability (40 CFR §64.2(a)(2)) because the boiler does not use a pollution control device to achieve compliance with any emission limitation or standard. CAM is not applicable to boilers B5 and B6.

Yarn Dye Lines (SL1 through SL4)

Limitations

Superba Dye Lines (SL1 – SL4): The following conditions are from the minor NSR permit dated 7/1/2008, as amended 10/22/2009 and August 8, 2013. A copy of the permit is attached (*Attachment C*).

- Condition 2: Emission Controls – VOC emissions from the carpet yarn dye used in SL1 – SL4 are limited to 0.000441 pounds VOC per pound of yarn dye as applied, calculated as a monthly weighted average.
- Condition 3: Emission Controls – VOC emissions from the carpet yarn lubricant used in SL1 – SL4 are limited to 0.004 pounds VOC per pound of yarn lubricant as applied, calculated as a monthly weighted average.
- Condition 4: Emission Controls – The condition establishes VOC work practice standards for the facility.
- Condition 6: Throughput – The throughput of carpet yarn dye shall not exceed 1,051,200 pounds per year per dye line (SL1 – SL4), calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- Condition 7: Throughput – The throughput of carpet yarn lubricant shall not exceed 262,800 pounds per year per dye line (SL1 – SL4), calculated monthly as the sum of each consecutive 12-month

period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

Condition 8: Emission Limitations – The condition establishes the hourly and annual emission limitations for the operation of SL1-SL4. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

Condition 9: Visible Emission Limit – Visible emissions from each exhaust stack of the dye lines (SL1 – SL4) shall not exceed five percent opacity as determined by EPA Method 9 (reference 50 CFR 60, Appendix A).

Monitoring and Recordkeeping

All dye lines: SL1 – SL4

The permit requires that VOC emissions from each of the dye lines be limited based on pounds of VOC per pound of yarn dye and per pound of yarn lubricant, as applied. The limits vary for each of the four lines. Periodic monitoring necessary to reasonably assure compliance with these requirements is accomplished by the following monitoring approach:

- The VOC content of each dye or lubricant as supplied shall be determined by the permittee or the supplier initially or when the dye or lubricant is modified or substituted using Reference Method 24 or 24A (40 CFR Part 60, Appendix A). Such content shall be used for purposes of calculating emissions, the monthly weighted average mass of VOC per mass of yarn dye as applied and the monthly weighted average mass of VOC per mass of yarn lubricant as applied.
- Each dye and lubricant as supplied whose SDS indicates a VOC content of 100 percent by weight may be assumed to be 100 percent VOC for the purpose of calculating emissions, the monthly weighted average mass of VOC per mass of yarn dye as applied and the monthly weighted average mass of VOC per mass of yarn lubricant as applied in lieu of Reference Method 24 or 24A (40 CFR Part 60, Appendix A) testing.
- Each new dye and lubricant as supplied received after the effective date of the permit or when the dye or lubricant is modified or substituted shall be tested by the permittee or supplier within 90 days of the receipt of shipment, modification or substitution. Each dye and lubricant as supplied shipment received shall be clearly identified by a product formulation number that may be correlated to Method 24 or 24A test results.
- Until such time as testing is conducted for the purpose of calculating the monthly weighted average mass of VOC per mass of yarn dye or lubricant as applied, or when Method 24 or

24A VOC content data is not available, the VOC content of each dye or lubricant as supplied shall be based on formulation data as shown on the SDS or other vendor information. If the VOC content is stated as a range, the maximum content value shall be used.

These conditions provide reasonable assurance that the VOC pound per pound of yarn dye as applied limit, the VOC pound per pound of yarn lubricant as applied limit and the emission limitation will be met.

Additionally, the monthly weighted average mass of VOC per mass of yarn dye or lubricant as applied for each dye line will be determined using the following equation:

$$VOC = \frac{\sum_{i=1}^n W_i M_i}{\sum_{i=1}^n M_i}$$

.....Equation 3

Where:

- VOC = the weighted average mass, in pounds, of VOC per mass, in pounds, of yarn dye or lubricant applied each calendar month
- W_i = the weight fraction of VOC of each yarn dye or lubricant (i) applied during the calendar month
- M_i = the total mass, in pounds, of each yarn dye or lubricant (i) applied during the calendar month

The permit requires that average hourly VOC emissions be determined in order to demonstrate compliance with the hourly emissions limits in the permit. The emissions shall be calculated on a monthly basis, for each dye line, using the equation below:

$$E_{voc} = \frac{\left(\sum_{i=1}^n W_{dye,i} M_{dye,i} + \sum_{i=1}^n W_{lub,i} M_{lub,i} \right)}{H}$$

.....Equation 1

Where:

- E_{voc} = the average hourly VOC emissions in pounds per hour
- W_{dye,I} = the weight fraction of VOC of each yarn dye (i) applied during the calendar month
- M_{dye,I} = the total mass, in pounds, of each yarn dye (i) applied during the calendar month
- W_{lub,I} = the weight fraction of VOC of each yarn lubricant (i) applied during the calendar month
- M_{lub,I} = the total mass, in pounds, of each yarn lubricant (i) applied during the calendar month
- H = the total number of hours of operation during the calendar month

The permittee shall determine compliance with the annual VOC emission limit for each dye line using the following equation:

$$E_{voc} = \frac{\left(\sum_{i=1}^n W_{dye,i} M_{dye,i} + \sum_{i=1}^n W_{lub,i} M_{lub,i} \right)}{2000}$$

.....Equation 2

Where:

- E_{voc} = the total monthly VOC emissions in tons
- $W_{dye,i}$ = the weight fraction of VOC of each yarn dye (i) applied during the calendar month
- $M_{dye,i}$ = the total mass, in pounds, of each yarn dye (i) applied during the calendar month
- $W_{lub,i}$ = the weight fraction of VOC of each yarn lubricant (i) applied during the calendar month
- $M_{lub,i}$ = the total mass, in pounds, of each yarn lubricant (i) applied during the calendar month

Annual VOC emissions shall be calculated monthly as the sum of each consecutive 12-month period.

The permit requires that visible emissions inspections be conducted on the each exhaust stack for each dye line, as follows:

At a minimum of once per week, the permittee shall determine the presence of visible emissions. If during the inspection, visible emissions are observed, visible emissions evaluation (VEE) shall be conducted in accordance with EPA Method 9 (reference 40 CFR 60, Appendix A). The VEE shall be conducted for a minimum of six minutes. If any of the observations exceed five percent opacity, the VEE shall be conducted for a total of 60 minutes. If the 60 minutes VEE indicates a violation of the standard, corrective action shall be taken.

All visible emissions inspections shall be performed when the equipment is operating.

If visible emissions inspections conducted during 12 consecutive weeks show no visible emissions for a particular stack, the permittee may reduce the monitoring frequency to once per month for that stack. Anytime the monthly visible emissions inspections show visible emissions, or when requested by DEQ, the monitoring frequency shall be increased to once per week for that stack.

All observations, VEE results, and corrective actions taken shall be recorded.

Compliance Assurance Monitoring

CAM does not apply to any of the yarn dye lines as none of the lines have add-on control devices.

Recordkeeping

The recordkeeping required by the minor NSR permits has been modified to meet Part 70 requirements. The permit includes requirements for maintaining records of all monitoring and testing required by the permit, including:

Superba Dye Lines (SL1 – SL4)

- a. Monthly hours of operation of each Superba Dye Line (SL1 – SL4)
- b. Monthly and annual throughput of carpet yarn dye (in pounds) used in each Superba Dye Line (SL1 – SL4). Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period.
- c. Monthly and annual throughput of carpet yarn lubricant (in pounds) used in each Superba Dye Line (SL1 – SL4). Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period.
- d. Hourly VOC emissions (in pounds) from each Superba Dye Line (SL1 – SL4), calculated as a monthly average.
- e. Monthly and annual VOC emissions (in tons) from each Superba Dye Line (SL1 – SL4). Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period.
- f. VOC content of carpet yarn dyes used in the Superba Dye Lines (SL1 – SL4) (in pounds per pound of yarn dye), calculated as a monthly weighted average
- g. VOC content of carpet yarn lubricant used in the Superba Dye Lines (SL1 – SL4) (in pounds per pound of yarn lubricant), calculated as a monthly weighted average.
- h. Safety Data Sheet (SDS) or other vendor information showing VOC content, hazardous air pollutant (HAP) content, water content, and solids content for each carpet yarn dye component and carpet yarn lubricant component.
- i. Scheduled and unscheduled maintenance and operator training for the Superba Dye Lines (SL1 – SL4).
- j. Results of all visible emission evaluations.

Testing

The permit requires that emissions testing be allowed at any time using appropriate methods and that the facility shall provide the appropriate location to conduct such testing.

Reporting

The permit requires no reporting specific to the dyeing operations.

Streamlined Conditions

There are no streamline conditions for the sections of the permit pertaining to the yarn dye lines.

Carpet Backing Lines

Latex Calcium Carbonate Filler Silo (LCS) and VAE Latex Filler Silo (VAES), including SBR Latex Mixer (SBRM), and VAE Latex Mixer (VAEM);

PVC Carpet Backing Line (PVC1), including PVC1 Calcium Carbonate Storage Silo (PVCS-C1), Filler Storage Silo (PVCS-C2), and PVC1 Feed Hopper (PVCS-FH);

Latex Pre-Coat Range (LPCR-1);

R&D Sample Hot Melt Extruder (HME-S); and

Tile Extrusion Line (TE1) including: Tile Line Extruders (TE1-MC), Tile Line Extruder Pellet Receiver Tanks (TE1-RTD1 through TE1-RTD4), Tile Line Extruder Pellet Feed Hoppers (TE1-HOP1 and TE1-HOP2), Trial Pellet Receiver Tanks (TE1-T1 and TE1-T2), and Pellet Storage Silos (Pellet 4 through Pellet 6).

Limitations

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

- 9 VAC 5-40-80 Existing Source Standard for Visible Emissions
- 9 VAC 5-40-260 Existing Source Standard for Particulate Matter (AQCR 1-6)
- 9 VAC 5-50-80 New Source Standard for Visible Emissions

The following conditions were established in the Title V permit pursuant to these codes:

- Condition 28.a: PM emissions from LCS shall not exceed the process weight limit as determined by the equation $E = 4.10P^{0.67}$, where E is the emission limit in lbs/hr and P is the process weight rate in tons/hr.
- Condition 29.a: Visible emissions from the LCS stack shall not exceed 20 percent opacity except during one six-minute period in any one hour in which visible emissions shall not exceed 60 percent.
- Condition 29.b: Visible emissions from the Latex Precoat Range (LPCR-1) shall not exceed 20 percent except during one six-minute period in any one hour in which visible emissions shall not exceed 30 percent opacity.

VAES – Calcium Carbonate Storage Silo: The following conditions are from the minor NSR permit dated 7/30/2009. Condition numbers listed reference the minor NSR permit. A copy of the permit is attached (*Attachment D*).

- Condition 2: Emission Controls – PM emissions from the filling of the silo and the return air from the transfer of filler to the VAE Latex Mixer (VAEM) shall be controlled by a fabric filter. The fabric filter shall be provided with adequate access for inspection and shall be in operation when the filling and transfer processes are operating.
- Condition 6: Throughput – The throughput of calcium carbonate shall not exceed 130,000 pounds per day, calculated as the sum of each consecutive 24-hour period.
- Condition 7: Throughput – The throughput of calcium carbonate shall not exceed 9,611 tons per year, calculated monthly as the sum of each consecutive 12-month period.
- Condition 8: Visible Emission Limit – Visible emissions from the VAES fabric filter exhaust shall not exceed five percent opacity as determined by EPA Method 9. This condition applies at all times except during startup, shutdown, and malfunction.

PVC1 – PVC Carpet Backing Line: The following conditions are from the minor NSR permit dated 7/13/2011. Condition numbers listed reference the minor NSR permit. A copy of the permit is attached (*Attachment E*).

- Condition 2: Emission Controls – PM emissions from PVC1 shall be controlled by a coalescing filter. The coalescing filter shall be provided with adequate access for inspection and shall be in operation when PVC1 is operating.
- Condition 3: Emission Controls – PM emissions from PVCS-C1, PVCS-C2, and PVCS-FH shall be controlled by fabric filters. The fabric filters shall be provided with adequate access for inspection and shall be in operation when the equipment is operating.
- Condition 7: Processing – PVCS-C1 and PVCS-C2 shall process no more than 120.0 tons/day, total, calculated daily.
- Condition 8: Processing – PVCS-C1 and PVCS-C2 shall process no more than 42,000.0 tons/year, total, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

- Condition 9: Throughput – The throughput of plastisol formula to the PVC1 shall not exceed 283.5 tons/day, calculated daily.
- Condition 10: Throughput – The throughput of plastisol formula to PVC1 shall not exceed 55,188.0 tons/year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- Condition 11: Process Emission Limits – The condition establishes the hourly and annual emission limitations for the PVC carpet backing line.
- Condition 12: Visible Emission Limit – Visible emissions from PVC1 shall not exceed five percent opacity as determined by EPA Method 9. This condition applies at all times except during startup, shutdown, and malfunction.
- Condition 13: Visible Emission Limit – Visible emissions from PVCS-C1, PVCS-C2, and PVCS-FH shall not exceed five percent opacity as determined by EPA Method 9. This condition applies at all times except during startup, shutdown, and malfunction.

LPCR-1 – Latex Pre-coat Range: The following conditions are from the minor NSR permit dated 3/24/2011 as amended 3/18/2015. Condition numbers listed reference the minor NSR permit. A copy of the permit is attached (*Attachment H*).

- Condition 4: Throughput – The throughput of VOC for latex mix used on LPCR-1 shall not exceed 24.3 tons/yr, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- Condition 5: Throughput – The throughput of VOC for topical mix on LPCR-1 shall not exceed 4.6 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- Condition 7: Process Emission Limits – The condition establishes the emission limitations for organic HAP from LPCR-1 on a kilograms per kilogram of solids applied basis.

Condition 8: Process Emission Limits – The condition establishes the hourly and annual emission limitations for the LPCR-1.

EC – Extruded Coat Carpet Backing Line: The following conditions are from the minor NSR permit dated 3/27/2006. Conditions numbers reference the minor NSR permit. A copy of the permit is attached (*Attachment F*). Note that HM1-HOP and Pellet 3 were never constructed; therefore, the applicable minor NSR conditions are not included below.

Condition 2: Emission Controls – PM emissions from HM1-RTD2, HM1-RTD3, and HM1-RTD4 shall each be controlled by a fabric filter. Each fabric filter shall be provided with adequate access for inspection and shall be in operation when the corresponding equipment for the pre-blended pellets is operating.

Condition 3: Fugitive Emission Controls – Fugitive PM emissions from the handling and transfer of pre-blended pellets shall be controlled by enclosure.

Condition 5: Throughput – The throughput of pre-blended pellets for EC shall not exceed 126.0 tons per day, calculated daily.

Condition 6: Throughput – The throughput of pre-blended pellets for EC shall not exceed 43,506.5 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

Condition 7: Throughput – The throughput of pre-blended pellets for HME-S shall not exceed 1,000.0 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

Condition 8: Process Emission Limits – The condition establishes the annual VOC emissions from the operation of EC.

Condition 9: Visible Emission Limit – Visible emissions from each fabric filter for HM1-RTD2, HM1-RTD3, and HM1-RTD4 shall not exceed five percent opacity as determined by EPA Method 9. This condition applies at all times except during start-up, shutdown, and malfunction.

Condition 10: Visible Emission Limit – Visible emissions from HM1-MC and HME-S shall not exceed five percent opacity as determined by

EPA Method 9. This condition applies at all times except during start-up shutdown and malfunction.

Condition 11: Visible Emission Limit – Visible fugitive emissions resulting from the handling and transfer of pre-blended pellets shall not exceed 10 percent opacity as determined by EPA Method 9. This condition applies at all times except during start-up, shutdown, and malfunction.

TE1 – Tile Extrusion Line: The following conditions are from the minor NSR permit dated August 4, 2016. Conditions numbers reference the minor NSR permit. A copy of the permit is attached (*Attachment G*). Note that TE1-HOP1 and TE1-HOP2 were never constructed; therefore, the applicable minor NSR conditions are not included below.

Condition 1: The condition establishes that particulate emissions from each tile line extruder pellet receiver tank (TE1-RTD1 – TE1-RTD4), each pellet storage silo (Pellet 4 – Pellet 6) and each trial pellet receiver tank (TE1-T1 and TE1-T2) shall be controlled by a fabric filter.

Condition 2: Fugitive particulate emissions from the handling and transfer of pre-blended pellets shall be controlled by enclosure.

Condition 4: The condition establishes the throughput of pre-blended pellets for the tile line extruders (TE1-MC).

Condition 5: The condition establishes the VOC emission limitations for the tile line extruders (TE1-MC).

Condition 6: The condition establishes the visible emission limitation for each tile line extruder pellet receiver tank (TE1-RTD1 – TE1-RTD4), each pellet storage silo (Pellet 4 – Pellet 6) and each trial pellet receiver tank (TE1-T1 and TE1-T2).

Condition 7: The condition establishes the visible emission limitation for the tile line extruder stack (TE1-MC).

Condition 8: The condition establishes the visible emission limitation for the handling and transfer of pre-blended pellets.

Condition 16: The condition establishes general requirements in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment, monitoring devices and process equipment which affect such emissions.

Monitoring

The permit requires the following equipment to be equipped with a device to continuously

measure the differential pressure drop across the fabric filter or coalescing filter, as applicable. The device shall be installed, calibrated, and operated in accordance with approved procedures, which shall include, as a minimum, the manufacturer’s written requirements or recommendations. The manufacturer’s written requirements or recommendations include the proper differential pressure range for each fabric filter. Each monitor shall be installed in an accessible location and shall be maintained by the permittee such that it is in proper working order at all times. To ensure good performance, the control device used to continuously measure the differential pressure drop shall be observed by the permittee with a frequency of not less than once per week. All readings shall be recorded.

- Latex Calcium Carbonate Filler Silo (LCS)
- VAE Latex Filler Silo (VAES)
- PVC Carpet Backing Line (PVC1) – coalescing filter
- Calcium Carbonate Storage Silo (PVCS-C1)
- Filler Storage Silo (PVCS-C2)
- Feed Hopper (PVCS-FH)
- Tile Line Extruder Pellet Receiver Tanks (TE1-RTD1 through –RTD4)
- Pellet Storage Silos 4 - 6

The permit requires operation of a fabric filter for the VAE latex filler silo (VAES), latex calcium carbonate filler silo (LCS), calcium carbonate storage silo (PVCS-C1), Filler Silo No. 2 (PVCS-C2), Feed Hopper (PVCS-FH), to demonstrate compliance with the particulate matter and visible emission requirements. Therefore, a properly operating fabric filter can achieve compliance with the process weight rate particulate emissions limit.

Emission Unit	Pollutant	Process Rate (lb/hr) ¹	PWR Limitation ²	Maximum Emission Rate (lbs/hr) ³
LCS	PM/PM-10	60,000	40.0	0.216
VAES	PM/PM-10	130,000	47.1	0.468
PVCS-C1	PM/PM-10	60,000	40.0	0.216
PVCS-C2	PM/PM-10	40,000	30.5	0.144
PVCS-FH	PM/PM-10	10,000	12.1	0.036

1. Process Rate is the manufacturer’s maximum rated capacity.
2. Process Weight Rate (PWR) Limitation calculated using the equation provided in 9 VAC 5-40-260 C and D

 $E = 4.10P^{0.67}$, where P = process weight rate (tons/hr) and E = emission rate (lb/hr) for processes up to 60,000 lbs/hr;
 $E = 55.0P^{0.11} - 40$, where P = process weight rate (tons/hr) and E – emission rate (lb/hr) for processes greater than 60,000 lbs/hr
3. Maximum Emission rate calculated using AP-42 (6/06), Table 11.12-2, SCC 3-05-011-07) and includes the use of a fabric filter with a 99% control efficiency. This emission factor (0.72 lbs PM/ton material) has historically been used by Aladdin and DEQ to determine PM emissions from these sources.

Proper operation and maintenance of the fabric filters shall provide reasonable assurance that compliance with the 20 percent opacity limit for the following sources will be achieved:

- Latex Calcium Carbonate Filler Silo (LCS)

Proper operation and maintenance of the fabric filters and coalescing filter (PVC1) shall provide reasonable assurance that compliance with the five percent opacity limit for the following sources will be achieved:

- VAE Latex Filler Silo (VAES)
- PVC Carpet Backing Line (PVC1) (coalescing filter)
- Calcium Carbonate Storage Silo (PVC1-C1)
- Filler Storage Silo (PVCS-C2)
- Feed Hopper (PVCS-FH)
- Tile Line Extruder Pellet Receiver Tanks (TE1-RTD1, -RTD2, -RTD3, and -RTD4)
- Tile Line Trial Pellet Receiver Tanks (TE1-T1 and TE1-T2)
- Pellet Storage Silos (Pellet 4, Pellet 5, and Pellet 6)

If visible emissions are seen from any of the fabric filter stacks it can be reasonably assumed that there is a problem with that fabric filter. The permit contains a requirement for the permittee to perform a tiered periodic monitoring approach for conducting visible emissions inspections for the sources:

- The permittee will be required to initially conduct a weekly inspection of each stack. Each inspection shall include an observation of the presence of visible emissions and the pressure drop across each fabric filter. If during the inspection visible emissions are observed, a visible emission evaluation (VEE) shall be conducted in accordance with 40 CFR Part 60, Appendix A, EPA Method 9, unless corrective action is taken such that the stack resumes operation with no visible emissions. The VEE shall be conducted for a minimum of six minutes. If any of the observations exceed the applicable opacity limit, the VEE shall be conducted for a total of 60 minutes. If 12 consecutive weekly inspections are performed on any given stack and no visible emissions are present, then the inspections for that stack may be reduced to once per week. However, as soon as visible emissions are noted during a weekly inspection, or when requested by DEQ, the inspections must then be performed weekly for that stack.

Visible emissions have been selected as the indicator because they are indicative of good operation and maintenance of a fabric filter and coalescing filter. If the fabric filter or coalescing filter is not functioning properly, visible emissions will be present and there is a chance that the permittee is in danger of not meeting the process weight rate particulate emissions limit. Therefore, visible emissions are an acceptable performance indicator.

The tiered approach for inspections will satisfy the periodic monitoring requirement for the visible emission limitations. The required frequency of checks for visible emissions will limit malfunctions of the control equipment. As long as the control equipment is operating properly, there is little likelihood of violating the visible emission limitation. The control equipment will limit the amount of particulates that are emitted thereby limiting visible emissions. The hot melt sample line (HMS) and Latex Pre-coat Range (LPCR-1) involve the application of a hot melt pre-coat and main coat directly to the back of the carpet. Only VOC are emitted during this process. Due to the fact that no particulate emissions are expected, no visible

emissions are expected. Therefore, there is little likelihood that the visible emission standard will ever be violated. As a result, no periodic monitoring is required for visible emissions from the stacks for these processes.

The permittee shall determine compliance with the hourly particulate matter emission limit for the PVC carpet backing line (PVC1) by calculating daily the average hourly emissions using the following equation:

$$E_{PM} = \left(\frac{M \times EF_{plast}}{H} \right) \left(\frac{100 - CE_{cf}}{100} \right)$$

.....Equation 6

Where:

- E_{PM} = the daily average hourly particulate matter emissions in pounds per hour
- M = the total throughput of plastisol formula, in pounds, used in the PVC carpet backing line during the calendar day
- H = the total number of hours of operation for the PVC carpet backing line during the calendar day
- EF_{plast} = the DEQ-approved emission factor in pounds of particulate per pound of plastisol
- CE_{cf} = control efficiency of the coalescing filter (98%)

The permittee shall determine compliance with the annual particulate matter emission limit for the PVC carpet backing line (PVC1) by calculating the monthly emissions using the following equation:

$$E_{PM} = \left(\frac{M \times EF_{plast}}{2000} \right) \left(\frac{100 - CE_{cf}}{100} \right)$$

.....Equation 7

Where:

- E_{PM} = the monthly particulate matter emissions in tons
- M = the total throughput of plastisol formula, in pounds, used in the PVC carpet backing line during the calendar month
- EF_{plast} = the DEQ-approved emission factor in pounds of particulate per pound of plastisol
- CE_{cf} = control efficiency of the coalescing filter (98%)

Annual particulate matter emissions shall be calculated monthly as the sum of each consecutive 12-month period.

The permittee shall determine compliance with the annual VOC emission limit for PVC1, HMS, EC, TE1-MC, and LPCR-1 by calculating the monthly emissions for each source using the following equation:

$$E_{voc} = \frac{\sum_{i=1}^n W_i M_i}{2000}$$

.....Equation 8

Where:

- E_{voc} = the total monthly VOC emissions in tons
- W_i = the weight fraction of VOC of each material (i) applied during the calendar month
- M_i = the total mass, in pounds, of each material (i) applied during the calendar month

Annual VOC emissions shall be calculated monthly as the sum of each consecutive 12-month period.

Compliance Assurance Monitoring

Compliance Assurance Monitoring (CAM) as required by 40 CFR 64 is not applicable to any of the pollutant specific emission units (PSEU) used in the Carpet Backing Lines. None of the emission units meets all three of the criteria necessary for CAM applicability as defined in §64.2.

(a)(1) The unit is subject to an emission limitation or standard for the applicable regulated pollutant. All units have hourly and annual emission rates for particulate matter.

(a)(2) The unit uses a control device to achieve compliance with the emissions limitation or standard. Particulate matter emissions from the processes are controlled by fabric filters or a coalescing filter

(a)(3) The unit has potential pre-control emissions greater than 100 TPY for the applicable pollutant. The pre-control emissions of PM from each of the sources do not exceed 100 TPY.

Because all three criteria are not met, CAM is not applicable to the fabric filters and coalescing filter used on the Carpet Backing Lines.

Recordkeeping

The recordkeeping required by the minor NSR permits has been modified to meet Part 70 requirements. The permit includes requirements for maintaining records of all monitoring and testing required by the permit, including:

VAES: Daily and annual throughput of calcium carbonate for the VAE filler silo (VAES). Daily throughput shall be calculated daily as the sum of each consecutive 24-hour period. Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period.

PVC Carpet Backing Line (PVC1)

- a. Daily hours of operation of the PVC carpet backing line (PVC1).
- b. Daily throughput of plastisol formula (in tons) used in the PVC carpet backing line (PVC1).
- c. Daily throughput of latex formula (in tons) used in the PVC carpet backing line (PVC1).
- d. Annual throughput of plastisol formula (in tons) used in the PVC carpet backing line (PVC1), calculated monthly as the sum of each consecutive 12-month period.
- e. Hourly PM, PM-10, and VOC emissions (in pounds) from the PVC carpet backing line (PVC1), calculated as a daily average.
- f. Annual PM, PM-10 and VOC emissions (in tons) from the PVC carpet backing line (PVC1), calculated as the sum of each consecutive 12-month period.
- g. Total daily throughput of calcium carbonate (in tons) to the calcium carbonate storage silo (PVCS-C1) and filler material to the filler silo (PVCS-C2), calculated daily.
- h. Total annual throughput of calcium carbonate (in tons) to the calcium carbonate storage silo (PVCS-C1) and filler material to the filler silo (PVCS-C2), calculated monthly as the sum of each consecutive 12-month period.

Hot Melt Sample Line (HMS)

- a. Monthly and annual throughput of VOC (in tons) in the materials used in the hot melt sample line (HMS). Annual throughput shall be calculated as the sum of each consecutive 12-month period.
- b. Monthly and annual VOC emission (in tons) from HMS. Annual throughput shall be calculated as the sum of each consecutive 12-month period.

Extruded Coat Backing Line (EC), including R&D Sample Hot Melt Extruder (HME-S)

- a. Annual throughput of pre-blended pellets (in tons) for the R&D sample hot melt extruder (HME-S), calculated monthly as the sum of each consecutive 12-month period;
- b. Monthly and annual VOC emissions (in tons) from HME-S. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period.

Tile Extrusion Line (TE1)

- a. Daily hours of operation of TE1.
- b. Daily throughput of pre-blended pellets (in tons) for the tile line extruders (TE1-MC).
- c. Annual throughput of pre-blended pellets (in tons) for for the tile line extruders (TE1-MC), calculated monthly as the sum of each consecutive 12-month period.
- d. Monthly and annual VOC emissions (in tons) from for the tile line extruders (TE1-MC). Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period.

Latex Pre-coat Range (LPCR-1)

- a. Annual throughput of VOC used for latex mix, calculated monthly as the sum of each consecutive 12-month period.
- b. Annual throughput of VOC used for topical mix, calculated monthly as the sum of each consecutive 12-month period.
- c. Annual emission calculations for VOC from LPCR-1 using the calculation methods submitted with application dated February 3, 2011, calculated monthly as the sum of each consecutive 12-month period.

General Recordkeeping Requirements applicable to all Carpet Backing Lines

- a. Air pollution control equipment training provided
- b. SDS or other vendor information showing VOC content, HAP content, water content, and solids content for each component of the following materials:
 - (1) Plastisol formula
 - (2) Latex formula
 - (3) Materials used on the Hot Melt Sample Line (HMS)
 - (4) Pre-blended Pellets
 - (5) Pre-coat Resin

- (6) Material stored in the filler silo (PVCS-C2)
- (7) Latex mix (LPCR-1)
- (8) Topical mix (LPCR-1)
- c. Scheduled and non-scheduled maintenance;
- d. Operator Training;
- e. Results of all visible emissions evaluations;
- f. Inspection records;
- g. DEQ-approved, pollutant-specific emission factors and the equations used to demonstrate compliance; and
- h. Operation and control device monitoring records for the differential pressure drop gauge.

These records shall be available on site for inspection by the DEQ and shall be current for the most recent five years.

Testing

The permit requires that emissions testing be allowed at any time using appropriate methods and that the facility shall provide the appropriate location to conduct such testing.

Reporting

The permit requires no reporting specific to the carpet backing operations.

Streamlined Conditions

The visible emission limitation in 9 VAC 5-50-80 (New Source Standard for Visible Emissions) has not been included for the VAE latex filler silo (VAES), calcium carbonate storage silo (PVCS-C1) and the PVC carpet backing line (PVC1) because the permit limit of five percent opacity is more stringent than the regulatory limit of 20 percent opacity, including one six-minute period in any one hour not to exceed 30 percent opacity.

Hazardous Air Pollutant Conditions – Printing, Coating, and Dyeing of Fabrics and Other Textiles

The compliance date for 40 CFR Part 63, Subpart OOOO - National Emission Standards for Hazardous Air Pollutants: Printing, Coating, and Dyeing of Fabrics and Other Textiles (Textile MACT), was May 29, 2006. Since the facility did not obtain federally enforceable limits on its facility-wide emissions of hazardous air pollutants (HAPs) to below major-source thresholds prior to this date, it is subject to the Textile MACT.

Limitations

The following conditions are the applicable Textile MACT limitations for the facility's operations: organic HAP emission limitations for the facility's operations:

Condition 41: Organic hazardous air pollutant (HAP) emissions from the facility shall not exceed the following limits:

- For web coating and printing operations, organic HAP emissions to the atmosphere are limited to 0.12 kilogram (kg) of organic HAP per kg of solids applied.
- For dyeing and finishing operations, organic HAP emissions to the atmosphere are limited to 0.016 kilogram (kg) of organic HAP per kg of dyeing and finishing materials applied.
- For the Latex Pre-coat Range (LPCR-1), organic HAP emissions to the atmosphere are limited to 0.08 kg of organic HAP per kg of solids applied, calculated as a rolling 12-month average emissions rate.

Condition 42: The permittee shall meet the following operation and maintenance requirements:

- At all times, including periods of startup, shutdown, and malfunction, the permittee shall operate and maintain the facility, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions at least to the levels required by all relevant standards.
- Malfunctions shall be corrected as soon as practicable after their occurrence.
- Operation and maintenance requirements established pursuant to section 112 of the Clean Air Act are enforceable independent of emissions limitations or other requirements in relevant standards.
- Determination of whether operation and maintenance procedures are being used will be based on information available to the DEQ which may include, but is not limited to, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

Monitoring

To demonstrate initial and continuous compliance with the applicable organic HAP emission limitations, Aladdin indicated in their application that the "compliant material option" and the "emission rate without add-on controls option" specified in the Textile MACT will be used.

Therefore, all applicable monitoring requirements from the Textile MACT for these two compliance options have been included in the Title V permit. These requirements provide adequate monitoring to meet periodic monitoring requirements. As a result, no additional monitoring has been included in the Title V permit.

Recordkeeping

The permit contains all applicable recordkeeping requirements from the Textile MACT for the “compliant material option” and the “emission rate without add-on controls option”, such as manufacturer’s formulation data or test data for each material used and calculations, to demonstrate compliance with the applicable organic HAP emission limitations. No additional recordkeeping has been included in the Title V permit.

Reporting

The Textile MACT requires the facility to submit a Notification of Compliance Status for the initial compliance period that applies to each affected source. Additionally, the Textile MACT requires the submittal of semiannual compliance reports for each affected source. These reporting requirements have been included in the Title V permit. The semiannual compliance reports will be submitted concurrently with the reporting requirements contained in General Condition 71 of the Title V permit.

Streamlined Requirements

The initial notification requirement associated with the Textile MACT has not been included in the permit because the source has already completed the requirement.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110 that apply to all Federal-operating permitted sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions.

Comments on General Conditions

Federal Enforceability

Article 1 (9VAC5-80-110 N) states that all terms and conditions in the Title V permit are enforceable by the administrator and citizens under the federal Clean Air Act, except those that have been designated as only state-enforceable.

Permit Expiration

This condition refers to the Board taking action on a permit application. The “Board” refers to the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §2.2-604 and §10.1-1185 of the *Code of Virginia*, and the “Department of Environmental Quality Agency Policy Statement No. 2-09”.

This general condition cites the Articles that follow:

Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Operating Permits for Stationary Sources

Failure / Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excess emission reporting within four hours of discovery. Section 9 VAC 5-80-250 of the Title V regulations also requires malfunction reporting; however, reporting is required within two days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to section 9 VAC 5-20-180 including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations. Title V facilities are subject to both sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within four daytime business hours of discovery of the malfunction.

This general condition cites the sections that follow:

9 VAC 5-40-40. Emissions Monitoring Procedures for Existing Sources
9 VAC 5-40-50. Notification, Records and Reporting
9 VAC 5-50-50. Notification, Records and Reporting

Permit Modification

This general condition cites the sections that follow:

9VAC5-80-50. Applicability, Federal Operating Permit for Stationary Sources
9VAC5-80-190. Changes to Permits

9VAC5-80-260. Enforcement

9VAC5-80-1100. Applicability, Permits For New and Modified Stationary Sources

9VAC5-80-1605. Applicability, Permits For Major Stationary Sources and Modifications
Located in Prevention of Significant Deterioration Areas

9VAC5-80-2000. Applicability, Permits for Major Stationary Sources and Major Modifications
Locating in Nonattainment Areas

Asbestos Requirements

The Virginia Department of Labor and Industry under Section 40.1-51.20 of the Code of Virginia also holds authority to enforce 40 CFR 61 Subpart M, National Emission Standards for Asbestos.

This general condition contains a citation from the Code of Federal Regulations that follow:

40 CFR 61.145, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to demolition and renovation.

40 CFR 61.148, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to insulating materials.

40 CFR 61.150, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to waste disposal.

This general condition cites the regulatory sections that follow:

9 VAC 5-60-70. Designated Emissions Standards

9 VAC 5-80-110 Permit Content

FUTURE APPLICABLE REQUIREMENTS

There were no future applicable requirements identified by the facility.

INAPPLICABLE REQUIREMENTS

Greenhouse Gas

The provisions of 40 CFR Part 98 – Mandatory Greenhouse Gas Reporting require owners and operators of general stationary fuel combustion sources that emit 25,000 metric tons CO_{2e} or more per year in combined emissions from such units, to report greenhouse gas (GHG) emissions, annually. The definition of “applicable requirement” in 40 CFR 70.2 and 71.2 does not include requirements such as those included in Part 98, promulgated under Clean Air Act

(CAA) section 114(a)(1) and 208. Therefore, the requirements of 40 CFR Part 98 are not applicable under the Title V permitting program.

As a result of several EPA actions regarding GHG under the CAA, emissions of GHG must be addressed for a Title V permit renewed after January 1, 2011. The current state minor NSR permits for the facility contain no GHG-specific applicable requirements and there have been no modifications at the facility requiring a PSD permit. Therefore, there are no applicable requirements for the facility specific to GHG.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
--	Storage Tanks	9 VAC 5-80-720 B	VOC	-
Oil Tank 1	Fuel Oil Tank	9 VAC 5-80-720 B	VOC	-
PVC1	PVC natural gas-fired oven burners	9 VAC 5-80-720 C	-	4.08 Million Btu/hr
PVC1	PVC natural gas-fired oven burners	9 VAC 5-80-720 C	-	1.7 Million Btu/hr
LPCR-1	LPCR-1 natural gas-fired Tile Line singer	9 VAC 5-80-720 C	-	0.7 Million Btu/hr
CT	Cooling Towers (3)	9 VAC 5-80-720 B	VOC, PM-10	

¹The citation criteria for insignificant activities are as follows:
9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
9 VAC 5-80-720 B - Insignificant due to emission levels
9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portion of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

A public notice regarding the draft permit was placed in the *News Gazette*, on March 15, 2017. West Virginia, the only affected state, was sent a copy of the public notice in a letter dated March 15, 2017. All persons on the Title V mailing list were also sent a copy of the public notice via either letter or email dated March 15, 2017. Public comments are accepted from March 15, 2017 through April 14, 2017. No comments were received from the public.

EPA was notified of the public notice and sent a copy of the Statement of Basis and draft permit on March 14, 2017. The EPA provided comments on the draft permit on April 11, 2017. The draft permit was revised to incorporate all of the changes recommended by EPA. Copies of EPA's comments, DEQ's response and EPA's concurrence are in Attachment J.

ATTACHMENTS

Attachment A	Emissions Inventory Report - 2016
Attachment B	State Operating Permit, dated December 2, 2009, as amended March 19, 2010, and August 6, 2013
Attachment C	Superba Dye Lines - Minor New Source Review Permit, dated July 1, 2008, as amended October 22, 2009 and August 8, 2013.
Attachment D	VAES Storage Silo - Minor New Source Review Permit, dated July 30, 2009
Attachment E	PVC Carpet Backing Line - Minor New Source Review Permit, dated July 13, 2011
Attachment F	Extruded Coat Carpet Backing Line – Minor New Source Review Permit, dated March 27, 2006
Attachment G	Tile Line Extrusion Line – Minor New Source Review Permit, dated April 28, 2006, as amended August 4, 2016
Attachment H	Latex Pre-Coat Range – Minor New Source Review Permit, dated March 24, 2011, as amended March 18, 2015
Attachment I	Potential To Emit Calculations
Attachment J	EPA Comments and DEQ Responses

Attachment A

Emissions Inventory Report – 2016

DEQ

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

2016 Emission Statement

RECEIVED
MAR -- 2 2017
To: _____
File: _____

FACILITY NAME Aladdin Manufacturing - Glasgow Facility		REGISTRATION # 80269
LOCATION ADDRESS 404 Anderson St Glasgow, VA 24555-2801		JURISDICTION Rockbridge County
MAILING ADDRESS 405 Anderson St Glasgow, VA 24555-2801		PRIMARY NAICS/CODE 314110
CONTACT PERSON Rebecca Bolden - Manager Env. Engineering	TELEPHONE NUMBER 706-272-4934	<i>For agency use only</i> Title V Major

FACILITY TOTAL (Sum emissions from attached pages)

TOTAL VOC EMISSIONS FOR 2016	15.93	TONS/YR	87.31	LBS/DAY
TOTAL NOX EMISSIONS FOR 2016	19.89	TONS/YR	109.00	LBS/DAY
TOTAL SO2 EMISSIONS FOR 2016	0.080	TONS/YR	N/A	LBS/DAY
TOTAL PM10 EMISSIONS FOR 2016	2.147	TONS/YR	N/A	LBS/DAY
TOTAL Pb EMISSIONS FOR 2016	0.000	TONS/YR	N/A	LBS/DAY
TOTAL TRS EMISSIONS FOR 2016	N/A	TONS/YR	N/A	LBS/DAY
TOTAL TMNOC EMISSIONS FOR 2016	N/A	TONS/YR	N/A	LBS/DAY
TOTAL non-VOC/non-PM HAP EMISSIONS FOR 2016	0.00	TONS/YR	N/A	LBS/DAY
TOTAL CO EMISSIONS FOR 2016	11.25	TONS/YR	N/A	LBS/DAY
TOTAL PM2.5 EMISSIONS FOR 2016	2.12	TONS/YR	N/A	LBS/DAY
TOTAL NH3 EMISSIONS FOR 2016	0.429	TONS/YR	N/A	LBS/DAY

PLEASE ATTACH "ANNUAL UPDATE" FORM

PLEASE ATTACH "EMISSION STATEMENT CERTIFICATION" with appropriate signature.

2016 Summary of Plant-Wide Emissions
Mohawk Industries, Inc. - Lees Carpet Division/Glasgow, VA

Calendar Year: 2015			Emissions (tons/yr)										
Emission Unit	Emission Unit ID(s)	Stk-Pt-Seg	PM ₁₀	PM _{2.5}	PM	SO ₂	NOx	CO	VOC	Pb	HAP	Total non-VOC/non-PM HAP	NH ₃
Boiler 5	B5	1-1-1, 1-1-2	0.060	0.060	0.060	0.005	9.796	0.669	0.044	0.00000	0.0408		0.025
Boiler 6	B6	2-2-1, 2-2-2	0.784	0.784	0.784	0.062	7.812	8.663	0.567	0.00000	0.5286		0.330
Yarn & Superba Dyeing / Drying	YD1-YD5	22-40-1, 22-40-2, 23-41-1, 24-42-1, 24-42-2	0.025	0.025	0.025				0.745		0.052		0.000
Latex CaCO ₃ Filler Silo	LCS	11-30-1	0.0065	0.0065	0.0102								
Latex Pre-coat line									1.21457		0.034		
PVC Tile Line & Burners	PVC1	9-26-1	1.177	1.177	1.177	0.014	2.284	1.919	4.804	0.0000	0.0465		0.073
PVC Filler Silo (CaCO ₃)	PVCS	9-26-2	0.0791	0.050532	0.050532								
R&D Sample Hot Melt Extruder	HME-S	17-34-1	0.0000009		0.0000009				0.0000006		0.00002768		
Tile Extrusion		18-35-1, 19-36-1, 19-37-1, 19-38-1	0.0155	0.0155	0.0155				8.560		0.49470		
Total Emissions (by type)			2.147	2.118	2.122	0.080	19.892	11.250	15.934	0.000	1.196	0.000	0.429

Total emissions by Pollutant

Pollutant	TPY
Ammonia	0.429
Carbon Monoxide	11.250
Nitrogen Oxide	20.308
Particulate Matter	2.122
Particulate Matter 10	2.147
Particulate Matter 2.5	2.118
Sulfur Dioxide	0.080
Vinyl Acetate	0 from PVC
Vinyl Chloride	0.003381
Maleic Anhydride	0.49470 from Tile Extrusion
Volatile Organic Compounds	15.934
all other HAPs	0.701

*all other HAPS - from NG burning and small amounts of various HAPs from the dyeing process

Attachment B

State Operating Permit, dated December 2, 2009, as amended March 19, 2010,
and August 6, 2013



COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO OPERATE

This permit replaces your permit dated December 2, 2009, as amended March 29, 2012.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Mohawk Industries, Inc.
404 Anderson Street
Glasgow, Virginia 24555-2801
Registration No.: 80269

is authorized to operate

two natural gas/ No. 2 distillate oil-fired boilers (B5 and B6)

located at

Mohawk Industries, Inc.
404 Anderson Street
Glasgow, Virginia 24555-2801

in accordance with the Conditions of this permit.

Approved on

December 2, 2009

Amended on

March 19, 2012

Amended on

8/6/13

Deputy Regional Director, Valley Region

Permit consists of 7 pages.
Permit Conditions 1 to 18.

INTRODUCTION

This permit approval is based on the permit applications dated September 15, 2009, December 16, 2011, and January 8, 2013, amended information dated April 15, 2013 and May 22, 2013, and additional information dated September 18, 2009, January 5, 2012, January 6, 2012, January 10, 2012, January 17, 2012, February 13, 2012, February 15, 2013, March 12, 2013, March 20, 2013, and April 2, 2013. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List** - Equipment at this facility consists of the following:

Equipment installed prior to the date of this permit			
Emission Unit ID	Equipment Description	Rated Capacity	Federal Requirements
Fuel Burning Equipment			
B5	Babcock and Wilcox natural gas or distillate oil-fired boiler (installed before 1972)	120 Million Btu/hr	N/A
B6	Babcock and Wilcox natural gas or distillate oil-fired boiler (installed before 1972)	72 Million Btu/hr	N/A

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.
(9 VAC 5-80-850)

2. **Emission Testing** - The boilers shall be installed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested and safe sampling platforms and access shall be provided. (9 VAC 5-80-880 and 9 VAC 5-80-850)

3. **Emission Controls** - Emissions from each boiler (Ref. B5 and B6) shall be controlled by proper operation and maintenance. Boiler operators shall be trained in the proper operation of all such equipment. Training shall consist of a review and familiarization of the manufacturer's operating instructions, at minimum. The permittee shall maintain records of the required training including a statement of time, place and nature of training provided. The permittee shall have available good written operating procedures and a maintenance schedule for the boilers. These procedures shall be based on the manufacturer's recommendations, at minimum.
(9 VAC 5-80-850)

OPERATING AND EMISSION LIMITATIONS

4. **Fuel** - The approved fuels for Boilers B5 and B6 are natural gas and distillate oil. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850)
5. **Fuel** - The distillate oil shall meet the ASTM D396 specification for Grades 1 or 2 fuel oil and shall not exceed 0.05 percent sulfur content per shipment.
(9 VAC 5-80-850)
6. **Fuel Throughput** - The total distillate oil fuel throughput for Boiler B5 shall not exceed 4,347,826 gallons per year, calculated monthly as the sum of each consecutive 12-month period. The total distillate oil fuel throughput for Boiler B6 shall not exceed 2,608,696 gallons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months. There is no fuel throughput limitation for the use of natural gas.
(9 VAC 5-80-850)
7. **Fuel Certification** - The permittee shall obtain a certification from the fuel supplier with each shipment of distillate oil. Each fuel supplier certification shall include the following:
 - a. The name of the fuel supplier;
 - b. The date on which residual or fuel oil was received;
 - c. The quantity of residual or fuel oil delivered in the shipment;
 - d. A statement that the distillate oil complies with the American Society for Testing and Materials specification (ASTM D396) for Grades 1 or 2 Low Sulfur fuel oil; and
 - e. The sulfur content of the distillate oil.

Fuel sampling and analysis, independent of that used for certification, as may be periodically required or conducted by DEQ may be used to determine compliance with the fuel specifications stipulated in Condition 5. Samples taken as required by this permit shall be analyzed in accordance with 1 VAC 30-45, Certification for Noncommercial Environmental Laboratories, or 1 VAC 30-46, Accreditation for Commercial Environmental Laboratories. Exceedance of these specifications may be considered credible evidence of the exceedance of emission limits.

(9 VAC 5-80-850)

8. **Emission Limits** – Emissions from the operation of boiler B5 shall not exceed the limits specified below:

Particulate Matter (filterable)	1.74 lbs/hr	4.76 tons/yr
PM-10 (total)	2.00 lbs/hr	6.67 tons/yr
PM-2.5 (total)	1.35 lbs/hr	5.04 tons/yr
Nitrogen Oxides	32.68 lbs/hr	143.16 tons/yr
Carbon Monoxide	9.81 lbs/hr	42.95 tons/yr
Sulfur Dioxide	6.17 lbs/hr	15.57 tons/yr
Volatile Organic Compounds	0.64 lbs/hr	2.81 tons/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 4, 5, and 6.
(9 VAC 5-80-850)

9. **Emission Limits** – Emissions from the operation of boiler B6 shall not exceed the limits specified below:

Particulate Matter (filterable)	1.04 lbs/hr	2.86 tons/yr
PM-10 (total)	1.20 lbs/hr	4.00 tons/yr
PM-2.5 (total)	0.81 lbs/hr	3.02 tons/yr
Nitrogen Oxides	10.43 lbs/hr	39.25 tons/yr
Carbon Monoxide	5.88 lbs/hr	25.77 tons/yr
Sulfur Dioxide	3.70 lbs/hr	9.34 tons/yr
Volatile Organic Compounds	0.39 lbs/hr	1.69 tons/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 4, 5, and 6.
(9 VAC 5-80-850)

RECORDS

10. **On Site Records** - The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the DEQ. These records shall include, but are not limited to:
- a. Annual throughput of distillate oil to each Boiler B5 and B6, calculated monthly as the sum of each consecutive 12-month period.
 - b. Annual throughput of natural gas to each Boilers B5 and B6, calculated monthly as the sum of each consecutive 12-month period.
 - c. All fuel supplier certifications.
 - d. Scheduled and unscheduled maintenance and operator training.
 - e. Records of malfunctions as required in Condition 12.
 - f. Records of maintenance, operating procedures, and training as required in Condition 15.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-850)

GENERAL CONDITIONS

11. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:
- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
 - b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
 - c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
 - d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-850)

12. **Record of Malfunctions** - The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date,

time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.
(9VAC 5-20-180 J and 9 VAC 5-80-850)

13. Notification for Facility or Control Equipment Malfunction - The permittee shall furnish notification to the DEQ of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone, or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the DEQ in writing.
(9 VAC 5-20-180 C and 9 VAC 5-80-850)

14. Violation of Ambient Air Quality Standard - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I and 9 VAC 5-80-850)

15. Maintenance/Operating Procedures – At all times, including periods of start-up, shutdown, soot blowing, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

(9 VAC 5-50-20 E and 9 VAC 5-80-850)

16. Permit Suspension/Revocation - This permit may be revoked if the permittee:

- a. Knowingly makes material misstatements in the permit application or any amendments to it;

- b. Fails to comply with the terms or conditions of this permit;
- c. Fails to comply with any emission standards applicable to a permitted emissions unit;
- d. Causes emissions from this facility which result in violations of, or interferes with the attainment and maintenance of, any ambient air quality standard;
- e. Fails to operate this facility in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time that an application for this permit is submitted;
- f. Fails to comply with the applicable provisions of Articles 6, 8 and 9 of 9 VAC 5 Chapter 80.

(9 VAC 5-80-1010)

17. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Valley Regional Office of the change of ownership within 30 days of the transfer.

(9 VAC 5-80-940)

18. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.

(9 VAC 5-80-860 D)

Attachment C

Superba Dye Lines - Minor New Source Review Permit, dated July 1, 2008, as amended October 22, 2009 and August 8, 2013



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE

**This permit includes designated equipment subject to
National Emission Standards for Hazardous Air Pollutants**

This permit replaces your permit dated July 1, 2008, as amended October 22, 2009.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Mohawk Industries, Inc. – Lees Carpet Division
404 Anderson Street
Glasgow, Virginia 24555-2801
Registration No.: 80269

is authorized to modify and operate

four Superba Dye Lines (SL1-SL4)

located at

404 Anderson Street
Glasgow, Virginia

in accordance with the Conditions of this permit.

Approved on July 1, 2008

Amended on October 22, 2009

Amended on 8/8/13

Deputy Regional Director, Valley Region

Permit consists of 7 pages.
Permit Conditions 1 to 20.

INTRODUCTION

This permit approval is based on permit applications dated May 22, 2013, September 11, 2009, August 6, 2009, and January 7, 2008, and supplemental information dated February 12, 2008, March 12, 2008, March 14, 2008, April 23, 2008, April 29, 2008, May 22, 2008, June 5, 2008, June 13, 2008, and June 26, 2008. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List** - Equipment at this facility consists of the following:

Equipment permitted prior to the date of this permit:			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
SL1	Superba Dye Line 1	300 lb yarn/hr	40 CFR 63, Subpart OOOO
SL2	Superba Dye Line 2	300 lb yarn/hr	40 CFR 63, Subpart OOOO
SL3	Superba Dye Line 3	300 lb yarn/hr	40 CFR 63, Subpart OOOO
SL4	Superba Dye Line 4	300 lb yarn/hr	40 CFR 63, Subpart OOOO

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.
(9 VAC 5-80-1180 D 3)

2. **Emission Controls** – Volatile organic compound (VOC) emissions from the carpet yarn dye used in the Superba Dye Lines (SL1 through SL4) are limited to 0.000441 pounds VOC per pound of yarn dye as applied, calculated as a monthly weighted average.
(9 VAC 5-80-1180)

3. **Emission Controls** – Volatile organic compound emissions from the carpet yarn lubricant used in the Superba Dye Lines (SL1 through SL4) are limited to 0.004 pounds VOC per pound of yarn lubricant as applied, calculated as a monthly weighted average.
(9 VAC 5-80-1180)

4. **VOC Work Practice Standards** - At all times the disposal of volatile organic compounds (VOCs) shall be accomplished by taking measures, to the extent practicable, consistent with air pollution control practices for minimizing emissions. VOCs shall not be intentionally spilled, discarded in sewers which are not connected to a treatment plant, or stored in open containers, or handled in any other manner that would result in evaporation beyond that consistent with air pollution practices for minimizing emissions.
(9 VAC 5-50-20 F and 9 VAC 5-80-1180)

5. **Emissions Testing** - The Superba Dye Lines (SL1 through SL4) shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested and safe sampling platforms and access shall be provided.
(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

OPERATING/EMISSION LIMITATIONS

6. **Throughput** – The throughput of carpet yarn dye shall not exceed 1,051,200 pounds per year per Superba Dye Line (SL1 through SL4), calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180)

7. **Throughput** – The throughput of carpet yarn lubricant shall not exceed 262,800 pounds per year per Superba Dye Line (SL1 through SL4), calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180)

8. **Emission Limits** – Total emissions from the operation of Superba Dye Lines (SL1 through SL4) shall not exceed the limits specified below:

Volatile Organic Compounds	0.72 lb/hr	3.17 tons/year
----------------------------	------------	----------------

These emissions are derived from the estimated overall emissions contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 2, 3, 6, and 7.
(9 VAC 5-80-1180)

9. **Visible Emission Limit** – Visible emissions from each exhaust stack of the Superba Dye Lines (SL1 through SL4) shall not exceed five percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A).
(9 VAC 5-80-1180)
10. **Requirements by Reference** - Except where this permit is more restrictive than the applicable requirement, the Superba Dye Lines (SL1 through SL4), as described in Condition 1, shall be operated in compliance with the requirements of 40 CFR 63, Subpart OOOO.
(9 VAC 5-80-1180, 9 VAC 5-60-90 and 9 VAC 5-60-100)

RECORDS

11. **On Site Records** – The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the DEQ. These records shall include, but are not limited to:
- a. Monthly hours of operation of each Superba Dye Line (SL1 through SL4).
 - b. Monthly and annual throughput of carpet yarn dye (in pounds) used in each Superba Dye Line (SL1 through SL4). Annual throughput for each line shall be calculated monthly as the sum of each consecutive 12-month period.
 - c. Monthly and annual throughput of carpet yarn lubricant (in pounds) used in each Superba Dye Line (SL1 through SL4). Annual throughput for each line shall be calculated monthly as the sum of each consecutive 12-month period.
 - d. Hourly VOC emissions (in pounds) from each Superba Dye Line (SL1 through SL4), calculated as a monthly average.
 - e. Monthly and annual VOC emissions (in tons) from each Superba Dye Line (SL1 through SL4). Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period.
 - f. VOC content of carpet yarn dyes used in the Superba Dye Lines (SL1 through SL4) (in pounds per pound of yarn dye), calculated as a monthly weighted average.
 - g. VOC content of carpet yarn lubricants used in the Superba Dye Lines (SL1 through SL4) (in pounds per pound of yarn lubricant), calculated as a monthly weighted average.
 - h. Scheduled and unscheduled maintenance and operator training for the Superba Dye Lines (SL1 through SL4).
 - i. Results of all stack tests, visible emission evaluations and performance evaluations.
 - j. Material Safety Data Sheets (MSDS) or other vendor information showing VOC content, HAP content, water content, and solids content for each carpet yarn dye component and carpet yarn lubricant component.

- k. Records of maintenance, operating procedures, and training as required in Condition 15.
- l. Records of bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment as required in Condition 16.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-1180 and 9 VAC 5-50-50)

12. **Testing/Monitoring Ports** - The permitted facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested at the appropriate locations and safe sampling platforms and access shall be provided.

(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

GENERAL CONDITIONS

13. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:

- a. Knowingly makes material misstatements in the permit application or any amendments to it;
- b. Fails to comply with the conditions of this permit;
- c. Fails to comply with any emission standards applicable to a permitted emissions unit;
- d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or
- e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9 VAC 5-80-1210 F)

14. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and

- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

- 15. Maintenance/Operating Procedures** – At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

- 16. Record of Malfunctions** – The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.

(9VAC 5-20-180 J and 9 VAC 5-80-1180 D)

- 17. Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the DEQ of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the DEQ.

(9 VAC 5-20-180 C and 9 VAC 5-80-1180)

18. **Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I and 9 VAC 5-80-1180)

19. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Valley Regional Office of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)

20. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

Attachment D

VAES Storage Silo - Minor New Source Review Permit, dated July 30, 2009



COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO MODIFY AND OPERATE

This permit supersedes your permit dated December 5, 1997.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Mohawk Industries, Inc. – Lees Carpet Division
404 Anderson Street
Glasgow, Virginia 24555
Registration No.: 80269

is authorized to modify and operate

a calcium carbonate storage silo (VAES)

located at

404 Anderson Street
Glasgow, Virginia

in accordance with the Conditions of this permit.

Approved on

July 30, 2009

A handwritten signature in cursive script, appearing to read "James M. Spivey".

Deputy Director, Valley Regional Office

Permit consists of 6 pages.
Permit Conditions 1 to 17.

INTRODUCTION

This permit approval is based on the permit applications dated June 5, 2009 and October 28, 1997, and March 2, 1994, including amendment information dated July 6, 2009 and November 10, 1997, and supplemental information dated November 10, 1997, and April 5, 1994. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action. In addition, this facility may be subject to additional applicable requirements not listed in this permit.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List** - Equipment at this facility consists of the following:

Equipment to be Modified			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
VAES	Calcium carbonate storage silo	5493 ft ³	N/A

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.
(9 VAC 5-80-1180 D 3)

2. **Emission Controls** – Particulate matter emissions from the filling of the silo and the return air from the transfer of filler to the VAE Latex Mixer (VAEM) shall be controlled by a fabric filter. The fabric filter shall be provided with adequate access for inspection and shall be in operation when the filling and transfer processes are operating.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

3. **Monitoring Devices** - The fabric filter shall be equipped with a device to continuously measure the differential pressure drop across the filter. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the control device is operating.
(9 VAC 5-80-1180 D)
4. **Monitoring Device Observation** – To ensure good performance, the control device used to continuously measure differential pressure drop shall be observed by the permittee with a frequency of not less than once per week. The permittee shall keep a log of the observations from the control monitoring device.
(9 VAC 5-80-1180 D)
5. **Emissions Testing** - The silo shall be modified so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested and safe sampling platforms and access shall be provided.
(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

OPERATING LIMITATIONS

6. **Throughput** - The throughput of calcium carbonate shall not exceed 130,000 pounds per day, calculated as the sum of each consecutive 24-hour period.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
7. **Throughput** - The throughput of calcium carbonate shall not exceed 9611 tons per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

EMISSION LIMITS

8. **Visible Emission Limit** - Visible emissions from VAES fabric filter exhaust shall not exceed five percent opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

RECORDS

9. **On Site Records** - The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Valley Regional Office. These records shall include, but are not limited to:

- a. Annual throughput of calcium carbonate, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- b. Daily throughput of calcium carbonate, calculated daily as the sum of each consecutive 24-hour period. Compliance for the consecutive 24-hour period shall be demonstrated daily.
- c. Operation and control device monitoring records for the differential pressure drop gauge as required in Condition 3.

GENERAL CONDITIONS

10. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:
- a. Knowingly makes material misstatements in the permit application or any amendments to it;
 - b. Fails to comply with the conditions of this permit;
 - c. Fails to comply with any emission standards applicable to a permitted emissions unit ;
 - d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or
 - e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9 VAC 5-80-1210 F)

11. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:
- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
 - b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
 - c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
 - d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

12. **Maintenance/Operating Procedures** – At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to the fabric filter:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

Records of maintenance and training shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.

(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

13. **Record of Malfunctions** – The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.
(9VAC 5-20-180 J and 9 VAC 5-80-1180 D)

14. **Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the Valley Regional Office of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the

estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the Valley Regional Office.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)

15. **Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I and 9 VAC 5-80-1180)
16. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Valley Regional Office of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)
17. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

Attachment E

PVC Carpet Backing Line - Minor New Source Review Permit, dated July 13, 2011



COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO MODIFY AND OPERATE

**This permit includes designated equipment subject to
National Emission Standards for Hazardous Air Pollutants.**

This permit supersedes your permit dated October 9, 2009.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia
Regulations for the Control and Abatement of Air Pollution,

Mohawk Industries, Inc.
404 Anderson Street
Glasgow, Virginia 24555-2801
Registration No.: 80269

is authorized to modify and operate

PVC carpet backing line, PVC1; calcium carbonate storage silo,
PVCS-C1; glass filler silo, PVCS-C2; and feed hopper, PVCS-FH

located at

404 Anderson Street
Glasgow, Rockbridge County, Virginia

in accordance with the Conditions of this permit.

Approved on

7/13/11

A handwritten signature in black ink, appearing to be "B. K. [unclear]", written over a horizontal line.

Deputy Regional Director, Valley Region

Permit consists of 8 pages.
Permit Conditions 1 to 25.

INTRODUCTION

This permit approval is based on the permit applications dated April 26, 2011, August 6, 2009, November 30, 2006, August 15, 2006, February 14, 2005, December 21, 2004, December 5, 2001, and February 10, 2000, including amendment information dated May 18, 2005, March 2 and 20, 2000, and February 11 and 24, 2000, and supplemental information dated June 6, 2011, May 31, 2011, September 8, 2009, April 21, 2005, March 31, 2005, February 1 and 7, 2002, and January 2 and 4, 2002, and supplemental information received May 3, 2005. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action. In addition, this facility may be subject to additional applicable requirements not listed in this permit.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List** - Equipment at this facility consists of the following:

Equipment to be modified			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
PVC1	PVC Carpet Backing Line	2,400 yd ² /hr, maximum	40 CFR 63, Subpart OOOO

Equipment permitted prior to the date of this permit			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
PVCS-C1	Calcium Carbonate Storage Silo	30 tons/hr	N/A
PVCS-C2	Filler Silo No. 2	40,000 lb/hr	N/A
PVCS-FH	PVC Filler Feed Hopper	10,000 lb/hr	N/A

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.
(9 VAC 5-80-1180 D 3)

2. **Emission Controls** - Particulate matter (PM) emissions from the PVC carpet backing line (PVC1) shall be controlled by a coalescing filter. The coalescing filter shall be provided with adequate access for inspection and shall be in operation when the PVC carpet backing line (PVC1) is operating.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
3. **Emission Controls** - PM emissions from the calcium carbonate storage silo (PVCS-C1), the filler storage silo (PVCS-C2), and the feed hopper (PVCS-FH) shall be controlled by fabric filters. The fabric filters shall be provided with adequate access for inspection and shall be in operation when the equipment is operating.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
4. **Monitoring Devices** - The coalescing filter shall be equipped with a device to continuously measure the differential pressure drop across the coalescing filter. The monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. The monitoring device shall be provided with adequate access for inspection and shall be in operation when the coalescing filter is operating.
(9 VAC 5-80-1180, 9 VAC 5-50-20 C and 9 VAC 5-50-260)
5. **Monitoring Devices** - The fabric filters shall each be equipped with a device to continuously measure the differential pressure drop across the fabric filter. The monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. The monitoring devices shall be provided with adequate access for inspection and shall be in operation when the fabric filter is operating.
(9 VAC 5-80-1180, 9 VAC 5-50-20 C and 9 VAC 5-50-260)
6. **Emissions Testing** - The filler silo (PVCS-C2) and the feed hopper (PVCS-FH) shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested and safe sampling platforms and access shall be provided.
(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

OPERATING/EMISSION LIMITATIONS

7. **Processing** – The calcium carbonate storage silo (PVCS-C1) and the filler silo (PVCS-C2) shall process no more than 120.0 tons/day, total, calculated daily.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
8. **Processing** – The calcium carbonate storage silo (PVCS-C1) and the filler silo (PVCS-C2) shall process no more than 42,000.0 tons/year, total, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be

demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

9. **Throughput** – The throughput of plastisol formula to the PVC carpet backing line (PVC1) shall not exceed 283.5 tons/day, calculated daily.
(9 VAC 5-80-1180)

10. **Throughput** – The throughput of plastisol formula to the PVC carpet backing line (PVC1) shall not exceed 55,188.0 tons/yr, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180)

11. **Process Emission Limits** – Emissions from the operation of the PVC carpet backing line (PVC1) shall not exceed the limits specified below:

Particulate Matter	0.35 lb/hr	1.52 tons/yr
PM-10	0.35 lb/hr	1.52 tons/yr
Volatile Organic Compounds (VOC)	1.29 lb/hr	5.63 tons/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 2, 9, and 10.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

12. **Visible Emission Limit** - Visible emissions from the PVC carpet backing line (PVC1) shall not exceed five percent opacity as determined by EPA Method 9 (reference 40 CFR Part 60, Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

13. **Visible Emission Limit** - Visible emissions from the calcium carbonate storage silo (PVCS-C1), the filler silo (PVCS-C2) and the feed hopper (PVCS-FH) shall not exceed five percent opacity as determined by EPA Method 9 (reference 40 CFR Part 60, Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

14. **Requirements by Reference** - Except where this permit is more restrictive than the applicable requirement, the PVC carpet backing line (PVC1), as described in Condition 1, shall be operated in compliance with the requirements of 40 CFR 63, Subpart OOOO.

(9 VAC 5-80-1180, 9 VAC 5-60-90 and 9 VAC 5-60-100)

RECORDS

15. **On Site Records** - The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Director, Valley Region. These records shall include, but are not limited to:

- a. Daily hours of operation of the PVC carpet backing line (PVC1).
- b. Daily throughput of plastisol formula (in tons) used in the PVC carpet backing line (PVC1).
- c. Daily throughput of latex (in tons) used in the PVC carpet backing line (PVC1).
- d. Annual throughput of plastisol formula (in tons) used in the PVC carpet backing line (PVC1), calculated monthly as the sum of each consecutive 12-month period.
- e. Hourly PM, PM-10, and VOC emissions (in pounds) from the PVC carpet backing line (PVC1), calculated as a daily average.
- f. Annual PM, PM-10 and VOC emissions (in tons) from the PVC carpet backing line (PVC1), calculated as the sum of each consecutive 12-month period.
- g. Material Safety Data Sheets (MSDS) or other vendor information showing VOC content, HAP content, water content, and solids content for each component of the plastisol formula.
- h. Material Safety Data Sheets (MSDS) or other vendor information showing VOC content, HAP content, water content, and solids content for each component of the latex.
- i. Material Safety Data Sheets (MSDS) or other vendor information showing VOC content and HAP content for each material stored in the filler silo (PVCS-C2).
- j. Total daily throughput of calcium carbonate (in tons) to the calcium carbonate storage silo (PVCS-C1) and filler material to the filler silo (PVCS-C2), calculated daily.
- k. Total annual throughput of calcium carbonate (in tons) to the calcium carbonate storage silo (PVCS-C1) and filler material to the filler silo (PVCS-C2), calculated monthly as the sum of each consecutive 12-month period.
- l. Facility or air pollution control device malfunctions, as required in Condition 21.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-1180 and 9 VAC 5-50-50)

NOTIFICATIONS

16. **Initial Notifications** - The permittee shall furnish written notification to the Valley Regional Office of the actual date on which modification to PVC1 is completed within 15 days after such date.
(9 VAC 5-50-50 and 9 VAC 5-80-1180)

GENERAL CONDITIONS

17. **Permit Invalidation** – The portions of this permit to modify the PVC Carpet Backing Line (PVC1) shall become invalid, unless an extension is granted by the DEQ, if:
- a. A program of continuous construction is not commenced within the latest of the following:
 - i. 18 months from the date of this permit;
 - ii. Nine months from the date that the last permit or other authorization was issued from any other governmental entity;
 - iii. Nine months from the date of the last resolution of any litigation concerning any such permits or authorization; or
 - b. A program of construction is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of a phased construction project.

(9 VAC 5-80-1210)

18. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:
- a. Knowingly makes material misstatements in the permit application or any amendments to it;
 - b. Fails to comply with the conditions of this permit;
 - c. Fails to comply with any emission standards applicable to a permitted emissions unit;
 - d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or
 - e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9 VAC 5-80-1210 F)

19. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

20. **Maintenance/Operating Procedures** – At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment, monitoring devices, and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

Records of maintenance and training shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.

(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

21. **Record of Malfunctions** – The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.
(9 VAC 5-20-180 J and 9 VAC 5-80-1180 D)
22. **Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the Valley Regional Office of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the Valley Regional Office.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)
23. **Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I and 9 VAC 5-80-1180)
24. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Valley Regional Office of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)
25. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

Attachment F

Extruded Coat Carpet Backing Line – Minor New Source Review Permit, dated March 27, 2006



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO CONSTRUCT, MODIFY AND OPERATE

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Mohawk Industries, Inc. - Lees Carpets Division
404 Anderson Street
Glasgow, Virginia 24555
Registration No.: 80269
Plant ID No.: 51-163-0001

is authorized to construct and operate

an extruded coat carpet backing line (EC) for the Hot Melt Line and a research and development sample hot melt extruder (HME-S)

and modify and operate

the pellet 2 storage silo (pellet 2)

located at

404 Anderson Street, Glasgow
Rockbridge County, Virginia

in accordance with the Conditions of this permit.

Approved on

March 27, 2006

Opus M. Simmons
Director, Department of Environmental Quality

Permit consists of 9 pages.
Permit Conditions 1 to 24.

INTRODUCTION

This permit approval is based on the permit application dated November 16, 2005, including supplemental information received December 20, 2005, December 22, 2005, January 16, 2006, January 18, 2006, February 3, 2006 and February 8, 2006. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-10 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List** - Equipment at this facility consists of the following:

Equipment to be constructed for the extruded coat carpet backing line (EC)			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
HM1-MC	Hot Melt Extruder	13,000 lbs/hr	---
HM1-HOP	Hot Melt Extruder Pellet Feed Hopper	13,000 lbs/hr	---
HM1-RTD2	Hot Melt Extruder Pellet Receiver Tank 2	45,000 lbs/hr	---
HM1-RTD3	Hot Melt Extruder Pellet Receiver Tank 3	45,000 lbs/hr	---
Pellet 3	Pellet 3 Storage Silo	110 tons	---
HM1-RTD4	Trial Pellet Receiver Tank	7,000 lbs/hr	---

Equipment to be constructed			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
HME-S	Research and Development (R&D) Sample Hot Melt Extruder	1,000 lbs/hr	---

Equipment to be modified			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
Pellet 2	Pellet 2 Storage Silo	110 tons	---

(9 VAC 80-1180 D 3)

2. **Emission Controls** - Particulate emissions from the hot melt extruder pellet feed hopper (HM1-HOP), hot melt extruder pellet receiver tank 2 (HM1-RTD2), hot melt extruder pellet receiver tank 3 (HM1-RTD3), pellet 2 storage silo (Pellet 2), pellet 3 storage silo (Pellet 3) and the trial pellet receiver tank (HM1-RTD4) shall each be controlled by a fabric filter. Each fabric filter shall be provided with adequate access for inspection and shall be in operation when the corresponding equipment for the pre-blended pellets is operating.
(9 VAC 5-80-1180)
3. **Fugitive Emission Controls** - Fugitive particulate emissions from the handling and transfer of pre-blended pellets shall be controlled by enclosure.
(9 VAC 5-80-1180)
4. **Monitoring Devices** - Each fabric filter shall be equipped with a device to continuously measure the differential pressure drop across the fabric filter. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the fabric filter is operating.
(9 VAC 5-80-1180 D)

OPERATING LIMITATIONS

5. **Throughput (P2)** - The throughput of pre-blended pellets for the extruded coat carpet backing line (EC) shall not exceed 126.0 tons per day, calculated daily.
(9 VAC 5-80-1180)
6. **Throughput (P2)** - The throughput of pre-blended pellets for the extruded coat carpet backing line (EC) shall not exceed 43,506.5 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180)

7. **Throughput (P2)** - The throughput of pre-blended pellets for the R&D sample hot melt extruder (HME-S) shall not exceed 1,000.0 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180)

EMISSION LIMITS

8. **Process Emission Limits** - Emissions from the operation of the extruded coat carpet backing line (EC) shall not exceed the limit specified below:

Volatile Organic
Compounds

9.57 tons/yr

These emissions are derived from the estimated overall emission contribution from the operating limit. Exceedance of the operating limit may be considered credible evidence of the exceedance of the emission limit. Compliance with this emission limit may be determined as stated in Condition number 6.

(9 VAC 5-80-1180)

9. **Visible Emission Limit** - Visible emissions from each fabric filter for the hot melt extruder pellet feed hopper (HM1-HOP), hot melt extruder pellet receiver tank 2 (HM1-RTD2), hot melt extruder pellet receiver tank 3 (HM1-RTD3), pellet 2 storage silo (Pellet 2), pellet 3 storage silo (Pellet 3) and the trial pellet receiver tank (HM1-RTD4) shall not exceed 5% opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during start-up, shutdown, and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-80)
10. **Visible Emission Limit** - Visible emissions from hot melt extruder (HM1-MC) and the R&D sample hot melt extruder (HME-S) shall not exceed 5% opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during start-up, shutdown, and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-80)
11. **Visible Fugitive Emission Limit** - Visible fugitive emissions resulting from the handling and transfer of pre-blended pellets shall not exceed 10% opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during start-up, shutdown and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-80)

CONTINUING COMPLIANCE DETERMINATION

12. **Visible Emissions Evaluation** - Upon request by the DEQ, the permittee shall conduct visible emission evaluations on any exhaust stack to demonstrate compliance with the visible

emission limits contained in this permit. The details of the tests shall be arranged with the Director, Valley Region.

(9 VAC 5-50-30 G)

13. **Emissions Testing** - The permitted facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested at the appropriate locations and safe sampling platforms and access shall be provided.

(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

RECORDS

14. **On Site Records** - The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Director, Valley Region. These records shall include, but are not limited to:

- a. Daily hours of operation of the extruded coat carpet backing line (EC).
- b. Daily throughput of pre-blended pellets (in tons) for the extruded coat carpet backing line (EC).
- c. Annual throughput of pre-blended pellets (in tons) for the extruded coat carpet backing line (EC), calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- d. Annual throughput of pre-blended pellets (in tons) for the R&D sample hot melt extruder (HME-S), calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- e. Monthly and annual VOC emissions (in tons) from the extruded coat carpet backing line (EC). Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- f. Monthly and annual VOC emissions (in tons) from the R&D sample hot melt extruder (HME-S). Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

- g. Material Safety Data Sheets (MSDS) or other vendor information showing VOC content, HAP content, water content and solids content for each component of the pre-blended pellets used.
- h. Scheduled and unscheduled maintenance, and operator training.
- i. Results of all visible emissions evaluations.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-1180 and 9 VAC 5-50-50)

NOTIFICATIONS

15. **Initial Notifications** - The permittee shall furnish written notification to the Director, Valley Region, of:

- a. The actual date on which construction of the extruded coat carpet backing line (EC) commenced within 30 days after such date.
- b. The actual date on which construction of the R&D sample hot melt extruder (HME-S) commenced within 30 days after such date.
- c. The actual date on which modification of the pellet 2 storage silo (Pellet 2) commenced within 30 days after such date.
- d. The actual start-up date of the extruded coat carpet backing line (EC) within 15 days after such date.
- e. The actual start-up date of the R&D sample hot melt extruder (HME-S) within 15 days after such date.
- f. The actual start-up date of the pellet 2 storage silo (Pellet 2) within 15 days after such date.

(9 VAC 5-50-50 and 9 VAC 5-80-1180)

GENERAL CONDITIONS

16. **Permit Invalidation** - This permit to construct the extruded coat carpet backing line (EC) and the R&D sample hot melt extruder (HME-S) and modify the pellet 2 storage silo (Pellet 2) shall become invalid, unless an extension is granted by the DEQ, if:

- a. A program of continuous construction or modification is not commenced within the latest of the following:

- i. 18 months from the date of this permit;
 - ii. Nine months from the date that the last permit or other authorization was issued from any other governmental entity;
 - iii. Nine months from the date of the last resolution of any litigation concerning any such permits or authorization; or
- b. A program of construction or modification is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of a phased construction project.

(9 VAC 5-80-1210)

17. Permit Suspension/Revocation - This permit may be suspended or revoked if the permittee:

- a. Knowingly makes material misstatements in the permit application or any amendments to it;
- b. Fails to comply with the conditions of this permit;
- c. Fails to comply with any emission standards applicable to a permitted emissions unit, included in this permit;
- d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or
- e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9 VAC 5-80-1210 F)

18. Right of Entry - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

19. **Maintenance/Operating Procedures** - At all times, including periods of start-up, shutdown and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

Records of maintenance and training shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.

(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

20. **Record of Malfunctions** - The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.
(9VAC 5-20-180 J and 9 VAC 5-80-1180 D)

21. **Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the Director, Valley Region, of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction.

When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the Director, Valley Region.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)

22. **Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I and 9 VAC 5-80-1180)
23. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Director, Valley Region, of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)
24. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

Attachment G

Tile Line Extrusion Line – Minor New Source Review Permit, dated April 28, 2006, as amended
August 4, 2016



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO MODIFY AND OPERATE

This permit supersedes your minor New Source Review (NSR) permit dated April 28, 2006.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Aladdin Manufacturing Corporation
404 Anderson Street
Glasgow, Virginia 24555
Registration No.: 80269

is authorized to modify and operate

a tile extrusion line (TE1)

located at

404 Anderson Street,
Glasgow (Rockbridge County), Virginia

in accordance with the Conditions of this permit.

Approved on

August 4, 2016

A handwritten signature in blue ink, appearing to be "B. J. ...", written over a horizontal line.

Deputy Regional Director, Valley Region

Permit consists of 8 pages.
Permit Conditions 1 to 21.

INTRODUCTION

This permit approval is based on the following permit applications:

Application Signature Date	Application Amendment Date	Application Additional Information Received Date
December 20, 2005	---	January 16, 2006, January 31, 2006, February 3, 2006, February 8, 2006, and April 24, 2006
June 9, 2016	June 9, 2016	---

Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-10 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

Equipment List - Equipment at this facility consists of the following:

Equipment to be modified			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
TE1-MC	Tile Line Extruders	12,800 lbs/hr	---

Equipment permitted prior to the date of this permit			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
TE1-RTD1	Tile Line Extruder Pellet Receiver Tank 1	45,000 lbs/hr	---

Equipment permitted prior to the date of this permit			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
TE1-RTD2	Tile Line Extruder Pellet Receiver Tank 2	45,000 lbs/hr	---
TE1-RTD3	Tile Line Extruder Pellet Receiver Tank 3	7,000 lbs/hr	---
TE1-RTD4	Tile Line Extruder Pellet Receiver Tank 4	10,000 lbs/hr	---
Pellet 4	Pellet 4 Storage Silo	110 tons	---
Pellet 5	Pellet 5 Storage Silo	110 tons	---
Pellet 6	Pellet 6 Storage Silo	110 tons	---
TE1-HOP1	Tile Line Extruder Pellet Feed Hopper 1	7,000 lbs/hr	---
TE1-HOP2	Tile Line Extruder Pellet Feed Hopper 2	10,000 lbs/hr	---
TE1-T1	Trial Pellet Receiver Tank 1	3,000 lbs/hr	---
TE1-T2	Trial Pellet Receiver Tank 2	6,000 lbs/hr	---

Specifications provided above are for informational purposes only and do not form enforceable terms or conditions of the permit.

PROCESS REQUIREMENTS

1. **Emission Controls** - Particulate emissions from each tile line extruder pellet receiver tank (TE1-RTD1 – TE1-RTD4), each tile line extruder pellet feed hopper (TE1-HOP1 and TE1-HOP2), each pellet storage silo (Pellet 4 – Pellet 6) and each trial pellet receiver tank (TE1-T1 and TE1-T2) shall be controlled by a fabric filter. Each fabric filter shall be provided with adequate access for inspection and shall be in operation when the corresponding equipment for the pre-blended pellets is operating.
(9 VAC 5-80-1180)
2. **Fugitive Emission Controls** - Fugitive particulate emissions from the handling and transfer of pre-blended pellets shall be controlled by enclosure.
(9 VAC 5-80-1180)
3. **Monitoring Devices** - Each fabric filter shall be equipped with a device to continuously measure the differential pressure drop across the fabric filter. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the fabric filter is operating.
(9 VAC 5-80-1180 D)

OPERATING LIMITATIONS

4. **Throughput** - The throughput of pre-blended pellets for the tile line extruders (TE1-MC) shall not exceed 56,064 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

EMISSION LIMITS

5. **Process Emission Limits** - Emissions from the operation of the tile line extruders (TE1-MC) shall not exceed the limit specified below:

Volatile Organic Compounds	23.18 tons/yr
-------------------------------	---------------

These emissions are derived from the estimated overall emission contribution from the operating limit. Exceedance of the operating limit may be considered credible evidence of the exceedance of the emission limit. Compliance with this emission limit may be determined as stated in Condition 4.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

6. **Visible Emission Limit** - Visible emissions from each tile line extruder pellet receiver tank (TE1-RTD1 – TE1-RTD4), each tile line extruder pellet feed hopper (TE1-HOP1 and TE1-HOP2), each pellet storage silo (Pellet 4 – Pellet 6) and each trial pellet receiver tank (TE1-T1 and TE1-T2) shall not exceed 5% opacity as determined by 40 CFR 60, Appendix A, Method 9. This condition applies at all times except during start-up, shutdown, and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-80)
7. **Visible Emission Limit** - Visible emissions from the tile line extruder stack (TE1-MC) shall not exceed 5% opacity as determined by 40 CFR 60, Appendix A, Method 9. This condition applies at all times except during start-up, shutdown, and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-80)
8. **Visible Fugitive Emission Limit** - Visible fugitive emissions resulting from the handling and transfer of pre-blended pellets shall not exceed 10% opacity as determined by 40 CFR 60, Appendix A, Method 9. This condition applies at all times except during start-up, shutdown and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-50)

CONTINUING COMPLIANCE DETERMINATION

9. **Visible Emissions Evaluation** - Upon request by the DEQ, the permittee shall conduct visible emission evaluations on any exhaust stack to demonstrate compliance with the visible emission limits contained in this permit. The details of the tests shall be arranged with the DEQ.
(9 VAC 5-80-1200 and 9 VAC 5-50-30 G)
10. **Emissions Testing** - The permitted facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports, safe sampling platforms, and access at the appropriate locations shall be provided when requested.
(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

RECORDS

11. **On Site Records** - The permittee shall maintain records of emissions data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the DEQ. These records shall include, but are not limited to:
- a. Annual throughput of pre-blended pellets (in tons) for the tile line extruders (TE1-MC), as required by Condition 4.
 - b. Annual VOC emissions (in tons) from the tile line extruders (TE1-MC), as required by Condition 5, calculated monthly as the sum of each consecutive 12-month period.
 - c. Globally Harmonized System Safety Data Sheets, Material Safety Data Sheets (MSDS), Certified Product Data Sheets, or other vendor information showing VOC content, HAP content, water content and solids content for each component of the pre-blended pellets used.
 - d. Records of maintenance, operating procedures, and training as required by Condition 16.
 - e. Scheduled and unscheduled maintenance, and operator training.
 - f. Results of all visible emissions evaluations.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-1180 and 9 VAC 5-50-50)

NOTIFICATIONS

12. **Initial Notifications** - The permittee shall furnish written notification to the DEQ, of:

- a. The actual date on which modification of the Tile Line Extruders (TE1-MC) commenced within 30 days after such date.
- b. The actual start-up date of the Tile Line Extruders (TE1-MC) within 15 days after such date.

(9 VAC 5-50-50 and 9 VAC 5-80-1180)

GENERAL CONDITIONS

13. **Permit Invalidation** - The portions of this permit to modify the Tile Line Extruders (TE1-MC) shall become invalid, unless an extension is granted by the DEQ, if:

- a. A program of continuous construction/replacement/modification is not commenced within 18 months from the date of this permit; or
- b. A program of modification is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of a phased construction project.

(9 VAC 5-80-1210)

14. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:

- a. Knowingly makes material misstatements in the permit application or any amendments to it;
- b. Fails to comply with the conditions of this permit;
- c. Fails to comply with any emission standards applicable to a permitted an emissions unit, included in this permit;
- d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or
- e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9 VAC 5-80-1210 F)

15. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;

- b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

- 16. Maintenance/Operating Procedures** - At all times, including periods of start-up, shutdown and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

- 17. Record of Malfunctions** - The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.

(9VAC 5-20-180 J and 9 VAC 5-80-1180 D)

- 18. Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the DEQ, of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the DEQ.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)
- 19. Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I and 9 VAC 5-80-1180)
- 20. Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the DEQ, of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)
- 21. Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

Attachment H

Latex Pre-Coat Range – Minor New Source Review Permit, dated March 24, 2011, as amended
March 18, 2015



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE

**This permit includes designated equipment subject to
National Emission Standards for Hazardous Air Pollutants for Printing, Coating, and Dyeing of
Fabrics and Other Textiles.**

This permit supersedes your permit dated March 24, 2011.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Mohawk Industries, Inc.
404 Anderson Street
Glasgow, Virginia 24555-2801
Registration No.: 80269
Plant ID: 51-163-0001

is authorized to modify and operate

a Latex Pre-Coat Range

located at

404 Anderson Street
Glasgow, Virginia

in accordance with the Conditions of this permit.

Approved on _____ March 24, 2011

Amended on _____ March 18, 2015

Deputy Regional Director, Valley Region

Permit consists of 6 pages.
Permit Conditions 1 to 17.

INTRODUCTION

This permit approval is based on the following permit applications:

Application Signature Date	Application Amendment Date	Application Additional Information Received Date
February 3, 2011	--	March 3, 2011
February 19, 2015	--	--

Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action. In addition, this facility may be subject to additional applicable requirements not listed in this permit.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

- Equipment List** - Equipment at this facility consists of the following:

Equipment permitted prior to the date of this permit			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
LPCR-1	Latex Pre-Coat Range	5,000 yd ² /hr	40 CFR 63, Subpart OOOO

Equipment not subject to permitting			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
LCS	Latex Calcium Carbonate Filler Silo (constructed prior to 1972)	60,000 lb/hr	N/A
SBRM	SBR Latex Mixer (constructed prior to 1972)	--	N/A

Equipment exempt from permitting			
Reference No.	Equipment Description	Rated Capacity	Exemption Citation
--	Latex Pre-Coat Oven, consisting of four natural gas burners, each rated at 2.5 MMBtu/hr	10.0 MMBtu/hr (combined)	9 VAC 5-80-1105 B.1.a(4)

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.
(9 VAC 5-80-1180 D 3)

2. **VOC Work Practice Standards** – At all times the disposal of volatile organic compounds (VOC) shall be accomplished by taking measures, to the extent practicable, consistent with air pollution control practices for minimizing emissions. Volatile organic compounds shall not be intentionally spilled, discarded in sewers which are not connected to a treatment plant, or stored in open containers, or handled in any other manner that would result in evaporation beyond that consistent with air pollution practices for minimizing emissions.
(9 VAC 5-50-20 F and 9 VAC 5-80-1180)
3. **Emissions Testing** - The Latex Pre-Coat Range (Ref. No. LPCR-1) shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested and safe sampling platforms and access shall be provided.
(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

OPERATING LIMITATIONS

4. **Throughput** - The throughput of VOC for latex mix used on the Latex Pre-Coat Range (Ref. No. LPCR-1) shall not exceed 24.3 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
5. **Throughput** - The throughput of VOC for topical mix on the Latex Pre-Coat Range (Ref. No. LPCR-1) shall not exceed 4.6 tons per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
6. **Requirements by Reference** - Except where this permit is more restrictive than the applicable requirement, the MACT equipment as described in Condition 1 shall be operated in compliance with the requirements of 40 CFR 63, Subpart OOOO.
(9 VAC 5-80-1180, 9 VAC 5-60-90 and 9 VAC 5-60-100)

EMISSION LIMITS

7. **Process Emission Limits** – Emissions of organic hazardous air pollutants (HAP) from the operation of the Latex Pre-Coat Range (Ref. No. LPCR-1) shall not exceed 0.08 kilograms per kilogram of solids applied, calculated as a rolling 12-month average emission rate. Compliance with these emission limits shall be demonstrated through the recordkeeping requirements stated in Condition 9.d.
(9 VAC 5-80-1180, 9 VAC 5-60-90, and 40 CFR 63.4291 (a)(2))

8. **Process Emission Limits** – Emissions from the operation of the Latex Pre-Coat Range (Ref. No. LPCR-1) shall not exceed the limits specified below:

Volatile Organic Compounds	6.6 lbs/hr	28.9 tons/yr
----------------------------	------------	--------------

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 4 and 5.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

RECORDS

9. **On Site Records** – The permittee shall maintain records of emissions data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the DEQ. These records shall include, but are not limited to:
- Annual throughput of VOC used for latex mix, calculated monthly as the sum of each consecutive 12-month period.
 - Annual throughput of VOC used for topical mix, calculated monthly as the sum of each consecutive 12-month period.
 - Annual emissions calculations for VOC from the Latex Pre-Coat Range (Ref. No. LPCR-1) using the calculation methods submitted with the application dated February 3, 2011, as verified by the DEQ, to verify compliance with the emissions limitations in Condition 8. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period.
 - Emissions calculations for organic HAP from the Latex Pre-Coat Range (Ref. No. LPCR-1) using the calculation methods defined in 40 CFR 63, Subpart OOOO, to verify compliance with the emissions limitations in Condition 7.
 - Material Safety Data Sheets (MSDS), Certified Product Data Sheets (CPDS), or other vendor information as approved by the DEQ showing VOC content for each material used in the latex mix and the topical mix formulas.
 - Scheduled and unscheduled maintenance, and operator training.
 - Records of maintenance, operating procedures, and training as required in Condition 12.
 - Records of bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment as required in Condition 13.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-1180 and 9 VAC 5-50-50)

GENERAL CONDITIONS

10. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:

- a. Knowingly makes material misstatements in the permit application or any amendments to it;
- b. Fails to comply with the conditions of this permit;
- c. Fails to comply with any emission standards applicable to a permitted emissions unit;
- d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or
- e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9 VAC 5-80-1210 F)

11. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

12. **Maintenance/Operating Procedures** – At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.

- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

13. **Record of Malfunctions** – The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.
(9VAC 5-20-180 J and 9 VAC 5-80-1180 D)
14. **Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the DEQ of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the DEQ.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)
15. **Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I and 9 VAC 5-80-1180)
16. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the DEQ of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)
17. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

Attachment I

Potential To Emit Calculations

Table 3-1
 Plant-wide Potential Emission Rate Summary for Criteria Pollutants
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal application

Emission Point Description	EPN	Calc. Table No.	Potential Emission Rates ¹													
			NOx (1)		Co		VOC		SO ₂		PM		CO _{2e}	Total HAPs		
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy	lb/hr	tpy	
Boiler 5	B5	3-2 B5 and B6 Combined, 3-4 B6, 3-19 GHG	32.94	144.28	9.88	43.28	0.65	2.83	6.17	15.43	2.87	7.17	61497.16	0.53	2.33	
Boiler 6	B6	3-2 B5 and B6 Combined, 3-4 B6, 3-19 GHG	10.43	30.92	5.93	25.97	0.39	1.70	3.70	9.26	1.72	4.30	36898.30	0.32	1.40	
Superba Lines	SL1-SL4	3-8, 3-9, 3-10	-	-	-	-	0.72	3.17	-	-	0.01	0.042	-	0.23	0.993	
Belmont Dye Line	BL1	3-11, 3-12, 3-13	-	-	-	-	17.49	76.63	-	-	0.12	0.53	-	0.24	1.0512	
Latex CaCO ₃ Filler Silo (LCS) and SBR Latex Mixer (SBRM)	LCS		-	-	-	-	-	-	-	-	0.22	0.95	-	-	-	
VAE Latex Filler Silo (VAES) and VAE Latex Mixer (VAEM)	VAES	3-7	-	-	-	-	-	-	-	-	0.47	0.03	-	-	-	
PVC Tile Line	PVC1	3-7, 3-18, 3-19	0.6	1.82	0.51	1.53	0.028	0.12	0.0036	0.01	0.57	2.5	3105.61	-	-	
PVC Silo (CaCO ₃)	PVCS-C1		-	-	-	-	-	-	-	-	0.22	0.15	-	-	-	
PVC Silo (CaCO ₃)	PVCS-C2		-	-	-	-	-	-	-	-	0.18	0.15	-	-	-	
Latex Precoat Range	LPCR-1	3-15, 3-16, 3-17, 3-19	1.00	3.00	0.84	2.52	1.85	8.12	0.006	0.018	0.145	0.248	5124.76	0.048	0.209	
R&D Extruder	HME-S	3-5	-	-	-	-	0.22	0.22	-	-	-	-	-	0.0635	0.0635	
Tile Extruder Line	TE1-MC	3-6, 3-7	-	-	-	-	5.29	23.18	-	-	-	-	-	1.11	4.86	
Pellet Receiver Tank 1	TE1-RTD1	3-7	-	-	-	-	-	-	-	-	5.00E-05	2.00E-04	-	-	-	
Pellet Receiver Tank 2	TE1-RTD2	3-7	-	-	-	-	-	-	-	-	5.00E-05	2.00E-05	-	-	-	
Pellet Receiver Tank 3	TE1-RTD3	3-7	-	-	-	-	-	-	-	-	5.00E-05	2.00E-05	-	-	-	
Pellet Receiver Tank 4	TE1-RTD4	3-7	-	-	-	-	-	-	-	-	5.00E-05	2.00E-05	-	-	-	
Pellet 4 Storage Silo	Pellet 4	3-7	-	-	-	-	-	-	-	-	2.50E-05	1.80E-05	-	-	-	
Pellet 5 Storage Silo	Pellet 5	3-7	-	-	-	-	-	-	-	-	2.50E-05	3.90E-05	-	-	-	
Pellet 6 Storage Silo	Pellet 6	3-7	-	-	-	-	-	-	-	-	2.50E-05	3.90E-05	-	-	-	
Trial Pellet Receiver 1	TE1-T1	3-7	-	-	-	-	-	-	-	-	7.00E-06	3.10E-05	-	-	-	
Trial Pellet Receiver 2	TE1-T2	3-7	-	-	-	-	-	-	-	-	1.00E-05	4.40E-05	-	-	-	

(1) lb/hr for Nox for B5 and B6 is higher for FO because of dividing by the 5000 hour permit limit. The TPY emissions are higher for Natural gas

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 DIVISION

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To: _____
 File: _____

Table 3-2
Boiler 5 Emission Calculations (EPN "B5")
Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

Calculation Input Data	Distillate Fuel Oil		Natural Gas	
	Number	Unit	Number	Unit
Rated Firing Capacity	120	MMBTU	120	MMBTU
Max. Hourly Fuel Fired	0.8695652	103 gal/hr	0.11764706	CF/HR
Max. Annual Fuel Fired	4347.8261	103 gal/hr	1030.58824	106 CF/YR
Fuel Heat Value (HHV)	138000	BTU/Gal	1,020	BTU/CF
Max Hours Annual Burn	5,000	Hours	8,760	Hours
Sulfur Content	0.05	wt%	2,000	gr/10 ⁶ scf

Hourly Emission Calculations for Criteria Pollutants	Distillate Fuel Oil		Natural Gas	
	Emission Factor ¹ (lb/10 ³ gal)	Potential to Emit ³ (lb/hr)	Emission Factor ² (lb/10 ⁶ scf)	Potential to Emit ³ (lb/hr)
NOx	24	20.86957	280	32.94118
CO	5	4.347826	84	9.882353
SO2	7.1	6.173913	0.6	0.070588
PM (Total)	3.3	2.869565	7.6	0.894118
VOC	0.2	0.173913	5.5	0.647059

Emission Calculations for HAPs	Distillate Fuel Oil		Natural Gas		Any Fuel
	Emission Factor ¹ (lb/10 ³ gal)	Potential to Emit ³ (lb/hr)	Emission Factor ² (lb/10 ⁶ scf)	Potential to Emit ³ (lb/hr)	Potential to Emit ⁴ (TPY)
Non-metallic HAPs	-	-	-	-	-
1,1,1-Trichloroethane	2.36E-04	2.05E-04	0.00E+00	0.00E+00	8.21E-04
2-Methylnaphthalene	0.00E+00	0.00E+00	2.40E-05	2.82E-06	1.98E-05
3-Methylchloranthrene	0.00E+00	0.00E+00	1.80E-06	2.12E-07	1.48E-06
7,12-Dimethylbenz(a)anthracene	0.00E+00	0.00E+00	1.60E-05	1.88E-06	1.32E-05
Acenaphthene	2.11E-05	1.83E-05	1.80E-06	2.12E-07	7.34E-05
Acenaphthylene	2.53E-07	2.20E-07	1.80E-06	2.12E-07	1.48E-06
Anthracene	1.22E-06	1.06E-06	2.40E-06	2.82E-07	4.24E-06
Benz(a)anthracene	4.01E-06	3.49E-06	1.80E-06	2.12E-07	1.39E-05
Benzene	2.14E-04	1.86E-04	2.10E-03	2.47E-04	1.73E-03
Benzo(a)pyrene	0.00E+00	0.00E+00	1.20E-06	1.41E-07	9.89E-07
Benzo(b,K)Fluoranthene	1.48E-06	1.29E-06	3.60E-06	4.24E-07	5.15E-06
Benzo(g,h,i)perylene	2.26E-06	1.97E-06	1.20E-06	1.41E-07	7.86E-06
Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	2.38E-06	2.07E-06	1.80E-06	2.12E-07	8.28E-06
Dibenzo(a,h)anthracene	1.67E-06	1.45E-06	1.20E-06	1.41E-07	5.81E-06
Dichlorobenzene	0.00E+00	0.00E+00	1.20E-03	1.41E-04	9.89E-04
Ethylbenzene	6.36E-05	5.53E-05	0.00E+00	0.00E+00	2.21E-04
Fluoranthene	4.84E-06	4.21E-06	3.00E-06	3.53E-07	1.68E-05
Fluorene	4.47E-06	3.89E-06	2.80E-06	3.29E-07	1.55E-05
Fluoride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	3.30E-02	2.87E-02	7.50E-02	8.82E-03	1.15E-01
Hexane	0.00E+00	0.00E+00	1.80E+00	2.12E-01	1.48E+00

**Table 3-2
Boiler 5 Emission Calculations (EPN "B5")**

Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

Table 3-2 B5 HAPs Continued

Indeno(1,2,3-cd)pyrene	2.14E-06	1.86E-06	1.80E-06	2.12E-07	7.44E-06
Naphthalene	1.13E-03	9.83E-04	6.10E-04	7.18E-05	3.93E-03
OCDD	3.10E-09	2.70E-09	0.00E+00	0.00E+00	1.08E-08
o-Xylene	1.09E-04	9.48E-05	0.00E+00	0.00E+00	3.79E-04
Pentane ⁸	0.00E+00	0.00E+00	2.60E+00	3.06E-01	2.14E+00
Phenanathrene	1.05E-05	9.13E-06	1.70E-05	2.00E-06	3.65E-05
Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	4.25E-06	3.70E-06	5.00E-06	5.88E-07	1.48E-05
Toluene	6.20E-03	5.39E-03	3.40E-03	4.00E-04	2.16E-02
Metallic HAPs					
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	5.58E-04	4.86E-04	2.00E-04	2.35E-05	1.94E-03
Barium ⁸	0.00E+00	0.00E+00	4.40E-03	5.18E-04	3.63E-03
Beryllium	4.19E-04	3.64E-04	1.20E-05	1.41E-06	1.46E-03
Cadmium	4.19E-04	3.64E-04	1.10E-03	1.29E-04	1.46E-03
Chromium	4.19E-04	3.64E-04	1.40E-03	1.65E-04	1.46E-03
Cobalt	0.00E+00	0.00E+00	8.40E-05	9.88E-06	6.93E-05
Copper	8.38E-04	7.28E-04	8.50E-04	1.00E-04	2.91E-03
Lead	1.26E-03	1.09E-03	5.00E-04	5.88E-05	4.37E-03
Manganese	8.38E-04	7.28E-04	3.80E-04	4.47E-05	2.91E-03
Mercury	4.19E-04	3.64E-04	2.60E-04	3.06E-05	1.46E-03
Nickel	4.19E-04	3.64E-04	2.10E-03	2.47E-04	1.73E-03
Selenium	2.09E-03	1.82E-03	2.40E-05	2.82E-06	7.28E-03
Vanadium ⁸	0.00E+00	0.00E+00	2.30E-03	2.71E-04	1.90E-03
Zinc ⁸	0.00E+00	0.00E+00	2.90E-02	3.41E-03	2.39E-02
Total HAPs	4.87E-02	4.23E-02	4.53E+00	5.32E-01	3.83E+00

1- All emission factors for Distillate Fuel Oil firing are from AP-42 Section 1.3 (May 2010) as follows: CO, Nox and SO2 factors are from Table 1.3-1 (see >100 MMBtu/hr, No. 2 oil fired, normal firing, w/o lox-Nox values).

2- All emission factors for natural gas firing are from AP-42 Section 1.4 (May 2010 as follows: All criteria pollutant factors are from Table 1.4-1 (see Large, Uncontrolled Pre-NSPS values)

3- Emission Rate in lb/hr = (Emission Factor) * (Hourly Fuel Fired)

4- Potential to Emit in tpy = (Max. Hourly Emission Rate for Either Fuel)*(8,760 hr/yr)/(2,000 lb/ton) Annual Emissions for Criteria Pollutants are listed on table *****. Distillate Fuel usage is limited to 5,000 hours; however, 8760 hours were used for this calculation.

5- The maximum annual fuel used stated hear is for capacity and for determining the maximum hourly fuel use. Annual Emissions for Criteria Pollutants are listed on Table ***** and based on combined fuel use in Boiler 5 and 6. The combined fuel use allowed is 1,016,634 MCF of Natural gas and 6,877,000 gallons of Distillate Fuel Oil.

6 - Max Fuel oil Based on Permit max of 6,956,522 gallons/year

7 - Max NG based on 1026 BTU - modify cell to the right of this comment for different NG BTU

8 - Added Pentane, Barium, Vanadium and Zinc

Table 3-3 (2016 Table 3-3)
Boiler 6 Emission Calculations (EPN "B6")

Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

Calculation Input Data	Distillate Fuel Oil		Natural Gas	
	Number	Unit	Number	Unit
Rated Firing Capacity	72	MMBTU	72	MMBTU
Max. Hourly Fuel Fired	0.52173913	103 gal/hr	0.07058824	CF/HR
Max. Annual Fuel Fired	2608.69565	103 gal/hr	618.352941	106 CF/YR
Fuel Heat Value (HHV)	138000	BTU/Gal	1,020	BTU/CF
Max Hours Annual Burn	5,000	Hours	8,760	Hours
Sulfur Content	0.05	wt%	2,000	gr/10 ⁶ scf

Hourly Emission Calculations for Criteria Pollutants	Distillate Fuel Oil		Natural Gas	
	Emission Factor ¹ (lb/10 ³ gal)	Potential to Emit ³ (lb/hr)	Emission Factor ² (lb/10 ⁶ scf)	Potential to Emit ³ (lb/hr)
NOx	20	10.43478	100	7.058824
CO	5	2.608696	84	5.929412
SO2	7.1	3.704348	0.6	0.042353
PM (Total)	3.3	1.721739	7.6	0.536471
VOC	0.2	0.104348	5.5	0.388235

Emission Calculations for HAPs	Distillate Fuel Oil		Natural Gas		Any Fuel
	Emission Factor ¹ (lb/10 ³ gal)	Potential to Emit ³ (lb/hr)	Emission Factor ² (lb/10 ⁶ scf)	Potential to Emit ³ (lb/hr)	Potential to Emit ⁴ (TPY)
Non-metallic HAPs	-	-	-	-	-
1,1,1-Trichloroethane	2.36E-04	1.23E-04	0.00E+00	0.00E+00	8.21E-04
2-Methylnaphthalene	0.00E+00	0.00E+00	2.40E-05	1.69E-06	1.98E-05
3-Methylchloranthrene	0.00E+00	0.00E+00	1.80E-06	1.27E-07	1.48E-06
7,12-Dimethylbenz(a)anthracene	0.00E+00	0.00E+00	1.60E-05	1.13E-06	1.32E-05
Acenaphthene	2.11E-05	1.10E-05	1.80E-06	1.27E-07	7.34E-05
Acenaphthylene	2.53E-07	1.32E-07	1.80E-06	1.27E-07	1.48E-06
Anthracene	1.22E-06	6.37E-07	2.40E-06	1.69E-07	4.24E-06
Benz(a)anthracene	4.01E-06	2.09E-06	1.80E-06	1.27E-07	1.39E-05
Benzene	2.14E-04	1.12E-04	2.10E-03	1.48E-04	1.73E-03
Benzo(a)pyrene	0.00E+00	0.00E+00	1.20E-06	8.47E-08	9.89E-07
Benzo(b,k)Fluoranthene	1.48E-06	7.72E-07	3.60E-06	2.54E-07	5.15E-06
Benzo(g,h,i)perylene	2.26E-06	1.18E-06	1.20E-06	8.47E-08	7.86E-06
Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	2.38E-06	1.24E-06	1.80E-06	1.27E-07	8.28E-06
Dibenzo(a,h)anthracene	1.67E-06	8.71E-07	1.20E-06	8.47E-08	5.81E-06
Dichlorobenzene	0.00E+00	0.00E+00	1.20E-03	8.47E-05	9.89E-04
Ethylbenzene	6.36E-05	3.32E-05	0.00E+00	0.00E+00	2.21E-04
Fluoranthene	4.84E-06	2.53E-06	3.00E-06	2.12E-07	1.68E-05
Fluorene	4.47E-06	2.33E-06	2.80E-06	1.98E-07	1.55E-05
Fluoride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-3 B5 HAPs Continued

Formaldehyde	3.30E-02	1.72E-02	7.50E-02	5.29E-03	1.15E-01
Hexane	0.00E+00	0.00E+00	1.80E+00	1.27E-01	1.48E+00
Indeno(1,2,3-cd)pyrene	2.14E-06	1.12E-06	1.80E-06	1.27E-07	7.44E-06
Naphthalene	1.13E-03	5.90E-04	6.10E-04	4.31E-05	3.93E-03
OCDD	3.10E-09	1.62E-09	0.00E+00	0.00E+00	1.08E-08
o-Xylene	1.09E-04	5.69E-05	0.00E+00	0.00E+00	3.79E-04
Pentane ⁸	0.00E+00	0.00E+00	2.60E+00	1.84E-01	2.14E+00
Phenanathrene	1.05E-05	5.48E-06	1.70E-05	1.20E-06	3.65E-05
Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	4.25E-06	2.22E-06	5.00E-06	3.53E-07	1.48E-05
Toluene	6.20E-03	3.23E-03	3.40E-03	2.40E-04	2.16E-02
Metallic HAPs					
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	5.58E-04	2.91E-04	2.00E-04	1.41E-05	1.94E-03
Barium ⁸	0.00E+00	0.00E+00	4.40E-03	3.11E-04	3.63E-03
Beryllium	4.19E-04	2.19E-04	1.20E-05	8.47E-07	1.46E-03
Cadmium	4.19E-04	2.19E-04	1.10E-03	7.76E-05	1.46E-03
Chromium	4.19E-04	2.19E-04	1.40E-03	9.88E-05	1.46E-03
Cobalt	0.00E+00	0.00E+00	8.40E-05	5.93E-06	6.93E-05
Copper	8.38E-04	4.37E-04	8.50E-04	6.00E-05	2.91E-03
Lead	1.26E-03	6.56E-04	5.00E-04	3.53E-05	4.37E-03
Manganese	8.38E-04	4.37E-04	3.80E-04	2.68E-05	2.91E-03
Mercury	4.19E-04	2.19E-04	2.60E-04	1.84E-05	1.46E-03
Nickel	4.19E-04	2.19E-04	2.10E-03	1.48E-04	1.73E-03
Selenium	2.09E-03	1.09E-03	2.40E-05	1.69E-06	7.28E-03
Vanadium ⁸	0.00E+00	0.00E+00	2.30E-03	1.62E-04	1.90E-03
Zinc ⁸	0.00E+00	0.00E+00	2.90E-02	2.05E-03	2.39E-02
Total HAPs	4.87E-02	2.54E-02	4.53E+00	3.19E-01	3.83E+00

1- All emission factors for Distillate Fuel Oil firing are from AP-42 Section 1.3 (May 2010) as follows: CO, Nox and SO2 factors are from Table 1.3-1 (see >100 MMBtu/hr, No. 2 oil fired, normal firing, w/o lox-Nox values).

2- All emission factors for natural gas firing are from AP-42 Section 1.4 (May 2010) as follows: All criteria pollutant factors are from Table 1.4-1 (see Large, Uncontrolled Pre-NSPS values) and Table 1.4-2. All non-

3- Emission Rate in lb/hr = (Emission Factor) * (Hourly Fuel Fired)

4- Potential to Emit in tpy = (Max. Hourly Emission Rate for Either Fuel)*(8,760 hr/yr)/(2,000 lb/ton)

Annual Emissions for Criteria Pollutants are listed on table *****. Distillate Fuel usage is limited to 5,000 hours; however, 8760 hours were used for this calculation.

5- The maximum annual fuel used stated here is for capacity and for determining the maximum hourly fuel use. Annual Emissions for Criteria Pollutants are listed on Table ***** and based on combined fuel use in Boiler 5 and 6. The combined fuel use allowed is 1,016,634 MCF of Natural gas and 6,877,000 gallons of Distillate Fuel Oil.

6 - Max Fuel oil Based on Permit max of 6,956,522 gallons/year

7 - Max NG based on 1026 BTU - modify cell to the right of this comment for different NG BTU value

8 - Added Pentane, Barium, Vanadium and Zinc

Table 3-4

MAXIMUM Annual Criteria Pollutant Summary for Boilers (EPN "B5 and B6")
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow,VA/Title V Renewal Application

Criteria Pollutant Emissions	Boiler 5 Any Fuel TPY	Boiler 6 Any Fuel TPY	All Boiler Combined TPY
NO _x	144.2824	30.91765	175.20005
CO	43.28471	25.97082	69.25553
SO ₂	15.43478	9.26087	24.69565
PM	7.173913	4.304348	11.478261
VOC	2.834118	1.700471	4.534589

Table 3-5
Research & Development Extruder Emission Calculation (EPN "HME-S")
Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/TitleV Renewal Application

A. Pre-Blended Backing Pellet Composition for Hot Melt Extruder				
Pellet Component	Fraction of Pellet Content	VOC Content	HAP Content	Explanation
Calcium Carbonate	60%	0%	0%	Inorganic chemical
Poyethylene Vinul Acetate (EVA)	39.7%	0.057%	0.016%	from Exxon Mobil Chemical Letter dated 4-23-03
Stearic Acid	0.20%	0%	0%	Per Stearic Acit SDS, no VOC
Carbon black	0.10%	0%	0%	Corbon only, no hydrocarbon
Total	100%	0.023%	0.006%	= Σ (Fraction of Pellet Content * Pollutant Content)

B. Hourly Emission Calculations

Backing Added onto carpet (Mass)	1000 lb/hr	Design max process rate
VOC Fraction of Backing Pellet	0.023 wt%	from section A above
VOC Potential Emission Rate	0.22629 lb/hr	= Mass backing additon * VOC Fraction/100%
HAP Fraction of Backing Pellet	0.006352 wt%	from section A above
HAP Potential Emission Rate	0.06352 lb/hr	=Mass Backing addtion * HAP Fraction /100%

C. Annual Emission Calculations

Annual Consumption of backing Pellet	2000000 lb/year	Voluntary process lmitation (1000 tons/yr
VOC Fraction of Backing Pellet	0.022629 wt%	from section A above
VOC Potential Emission Rate	0.22629 tpy	= Mass backing additon * VOC Fraction/100%
HAP Fraction of Backing Pellet	0.006352 wt%	from section A above
Hap Potential Emission Rate	0.06352 tpy	=Mass Backing addtion * HAP Fraction /100%

Table 3-6
Title Extruder VOC Emissions Calculations (EPC "TE1-MC)
Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/TitleV Renewal Application

Both of the Tile Extruders are addressed in the following calculations.

A. Pre-blended Backing Pellet Composition for Hot Melt Extruder Process				
Pellet Component of 2124	Pellet Content by Weight¹	VOC Content by Weight²	Total HAP Content³	Explanation
Calcium Carbonate	70.0%	-	-	Worst case scenario for 70% formulation of pellet.
Polyolefin Copolymer / Terpolymer (Vistamaxx 6502)	19.9%	0.1500%	0.0333%	
Aliphatic Hydrocarbon Resin (Escorez)	5.0%	0.1000%	0.0000%	
Polyolefin (Achieve)	3.0%	0.1500%	0.001250%	
Maleated Olefin Polymer (Exxelor 1040)	2.0%	0.1000%	0.1000%	From Exxelor 1040 SDS
Black Polyethylene Concentrate (PE-555A)	0.1%	0.0000%	0.0000%	Carbon black (carbon only) and barium sulfate filler
Total	100%	0.0414%	0.0087%	= Σ (Fraction of Pellet Content * Pollutant Content)

B. Hourly Emission Calculations		
Backing Added onto Carpet (Add-on)	4 lb/yd ²	Design add-on rate
Carpet Processing Rate (Linear)	80 ft/min	Maximum achievable processing rate
Carpet Width	6 ft	Standard width
Carpet Processing Rate (Area)	3,200 yd ² /hr	= Processing Rate * Width / (9 sq ft/sq yd)
Backing Added onto Carpet	12,800 lb/hr	= Area Processing Rate * Add-on
Backing Added onto Carpet	153.6 tpd	
VOC Fraction of Backing Pellet	0.0414 wt%	From Section A above
VOC Potential Emissions	5.29 lb/hr	= Mass Backing Addition * VOC Fraction / 100%
HAP Fraction of Backing Pellet	0.009 wt%	From Section A above
HAP Potential Emission Rate	1.11 lb/hr	= Mass Backing Addition * HAP Fraction / 100%

C. Annual Emission Calculations		
Consumption of Backing Pellet	112,128,000 lb/year	Expected Use
Consumption of Backing Pellet	56,064.0 tpy	
VOC Fraction of Backing Pellet	0.0414 wt%	From Section A above
VOC Potential Emissions	23.18 tpy	= Annual Consumption * VOC% / (2000 lb/ton)
HAP Fraction of Backing Pellet	0.0087 wt%	
HAP Potential Emission Rate	4.86 tpy	

Notes:

- 1 - Pellet composition taken from 2124 Thermoplastic Pellet SDS provided by the facility and is located in Appendix A.
- 2 - VOC content taken from chemical data provided by ExxonMobil, included as Table 3-6.
- 3 - Individual HAP content taken from chemical data provided by ExxonMobil, included as Table 3-7. Individual HAP emission calculations are included in Table 3-8.

Table 3-7
 Backing Material Storage and Processing Emission Calculations
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

No emissions of VOC or HAP are calculated for pellet handling or storage operations because all VOC and HAP present in the pellets are conservatively assumed to be wmitted from the pre-coat and extrusion processes.

Max. Operating Time for Equipment = 8,760 hr/year

EPN and Source Name		Max. Throughput		Emission Factors		Filter Control Efficiency ²	Potential to Emit			
		Hourly	Annual	PM	PM ₁₀		PM		PM ₁₀	
		(lb/hr)	(tpy) (a)	(lb/ton)	(lb/ton)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	
LCS	Latex CaCO ₃ Filler Silo (LCS) and SBR Latex Mixer (SBRM) ⁴	60,000	262,800	0.72	0.46	99.0%	0.21600	0.94608	0.13800	0.60444
PVCS-C1	PVC Silo (CaCO ₃) ⁴	60,000	42,000	0.72	0.46	99.0%	0.21600	0.15120	0.13800	0.09660
PVCS-C2	Filler Silo #2 (PVCS-C2) and PVC Filler Feed Hopper (PVCS-FH) ⁴	50,000	42,000	0.72	0.46	99.0%	0.18000	0.15120	0.11500	0.09660
VAES	VAE Latex Filler Silo (VAES) & VAE Latex Mixer ⁴	130,000	9,611	0.72	0.46	99.0%	0.46800	0.03460	0.29900	0.02211
Pellet 2	Pellet 2 Storage Silo	45,000	197,100	0.002	0.002	99.9%	0.00005	0.00020	0.00005	0.00020
TE1-MC	Tile Line Extruder	13,000	56,064	0.002	0.002		0.01300	0.05606	0.01300	0.05606
TE1-RTD1	Pellet Receiver Tank 1	45,000	197,100	0.002	0.002	99.9%	0.00005	0.00020	0.00005	0.00020
TE1-RTD2	Pellet Receiver Tank 2	45,000	197,100	0.002	0.002	99.9%	0.00005	0.00020	0.00005	0.00020
TE1-RTD3	Pellet Receiver Tank 3	45,000	197,100	0.002	0.002	99.9%	0.00005	0.00020	0.00005	0.00020
TE1 RTD4	Pellet Receiver Tank 4	45,000	197,100	0.002	0.002	99.9%	0.00005	0.00020	0.00005	0.00020
Pellet 4	Pellet 4 Storage Silo	25,000	17,520	0.002	0.002	99.9%	0.00003	0.00002	0.00003	0.00018
Pellet 5	Pellet 5 Storage Silo	25,000	39,420	0.002	0.002	99.9%	0.00003	0.00004	0.00003	0.00039
Pellet 6	Pellet 6 Storage Silo	25,000	39,420	0.002	0.002	99.9%	0.00003	0.00004	0.00003	0.00039
TE1-T1	Trial Pellet Receiver 1	7,000	30,660	0.002	0.002	99.9%	0.00001	0.00003	0.00001	0.00031
TE1-T2	Trial Pellet Receiver 2	10,000	43,800	0.002	0.002	99.9%	0.00001	0.00004	0.00001	0.00044
Total PM Emissions							1.093	1.340	0.703	0.877

Sample Calculations:

lb/hr PM Emissions = ((130000 lb pellet/hr * 0.72 lb PM/ton pellet) / 2000 lb/ton) * (1-0.99 lb PM controlled/lb PM) = 0.468 lb PM/hr

tpy PM Emissions = (0.468 lb pellet/hr * 8760 hr/yr)/ 2000 lb/ton = 2.04984 tpy PM

Notes:

(a) PVCS, VAES, TE1-MC, have permit limits. Used these limits at Annual Max thruput in TPY

Table 3-8
 Superba Dye Lines 1 through 4 - VOC Potential to Emit Calculations (EPN "SL1, SL2, SL3, SL4")
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

A. Process Unit Information							
Process Unit Description:	Variable	Superba Line 1 - Solid Dye Machines	Superba Line 2 - Solid Dye Machines	Superba Line 3 - Solid Dye Machines	Superba Line 4 - Solid Dye Machines		Reference
Emission Unit I.D.		SL1	SL2	SL3	SL4		
A.1 Production Rate							
Hourly Rate (lb yarn/hr):	Qh	300	300	300	300		Maximum Rated Capacity
Max. Operating Schedule (hr/yr):	Hmax	8,760	8,760	8,760	8,760		Maximum Rated Capacity
Annual Dye Solution (lb/yr)	Qadye	1,051,200	1,051,200	1,051,200	1,051,200		Process Knowledge
Annual Lubricant Solution (lb/yr)	Qalub	262,800	262,800	262,800	262,800		Current Permitted Allowable
A.2 Batch Information							
Highest VOC in dye (wt%)	VOCdye	0.0441%	0.0441%	0.0441%	0.0441%		Process Knowledge
Highest VOC in lubricant (wt%)	VOClub	0.4%	0.4%	0.4%	0.4%		Process Knowledge
B. Batch Emission Calculations							
Maximum VOC Emissions, Dye:							
Max. Hourly: (lb/hr)	Ehdye	0.05	0.05	0.05	0.05		Eadye / Havg
Max Annual: (tpy)	Eadye	0.23	0.23	0.23	0.23		Qadye * VOCdye / 2000
Maximum VOC Emissions, Lubricant:							
Max. Hourly: (lb/hr)	Ehlub	0.13	0.13	0.13	0.13		Ealub / Havg
Max Annual: (tpy)	Ealub	0.56	0.56	0.56	0.56		Qalub * VOClub / 2000
Maximum VOC Emissions, Total:							
						Totals	
Max. Hourly: (lb/hr)	Eh	0.18	0.18	0.18	0.18	0.72	Ehdye + Ehlub
Max Annual: (tpy)	Ea	0.79	0.79	0.79	0.79	3.17	Eadye + Ealub

Table 3-9

Superba Dye Lines 1 through 4 - HAPs Potential to Emit Calculations (EPN "SL1, SL2, SL3, and SL4")
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

A. Process Unit Information				
Process Unit Description:	Superba Line 1 - Solid Dye Machines SL1	Superba Line 2 - Solid Dye Machines SL2	Superba Line 3 - Solid Dye Machines SL3	Superba Line 4 - Solid Dye Machines SL4
Emission Unit I.D.				
A.1 Production Rate				
Max. Hourly Rate (lb yarn/hr) ¹ :	300	300	300	300
Max. Operating Schedule (hr/yr):	8,760	8,760	8,760	8,760
Max. Annual Rate (lb yarn/yr):	2,628,000	2,628,000	2,628,000	2,628,000
A.2 Batch Information				
Compound:	Lubricant	Lubricant	Lubricant	Lubricant
% of time used:	100%	100%	100%	100%
Ratio of Lube/Yarn (lb/lb):	0.1/1.0	0.1/1.0	0.1/1.0	0.1/1.0
A.3 Max Wet Usage Rate				
Max. Hourly Rate (lb/hr):	30.00	30.00	30.00	30.00
Max. Annual Rate (tpy):	131.40	131.40	131.40	131.40

B. Maximum Individual HAP Potential to Emit Per Superba Dye Line			
	Ethylene Oxide	1,4-Dioxane	Acetaldehyde
HAP (lb / lb)	0.0009	0.0009	0.0009
HAP (lb/hr)	0.0270	0.0270	0.0027
HAP (pound/yr)	236.52	236.52	23.65
HAP (ton per year)	0.118	0.118	0.012
TOTAL			
All HAPs per Line (TPY)	0.248	emitted as fugitives from spool rewinding	
	0.993384	All 4 lines	
		0.2268 lb/hr	

Table 3-10
Superba Dye Lines 1 through 4 - PM Potential to Emit Calculations (EPN "SSL1, SL2, SL3, and SL4")
Aladdin Manufacturing Inc - Glasgow

A. Process Unit Information				
Process Unit Description:	Superba Line 1 - Solid Dye Machines	Superba Line 2 - Solid Dye Machines	Superba Line 3 - Solid Dye Machines	Superba Line 4 - Solid Dye Machines
Emission Unit I.D.	SL1	SL2	SL3	SL4
A.1 Production Rate				
Max. Hourly Rate (lb yarn/hr) ¹ :	300	300	300	300
Max. Operating Schedule (hr/yr):	8,760	8,760	8,760	8,760
Max. Annual Rate (lb yarn/yr):	2,628,000	2,628,000	2,628,000	2,628,000
A.2 Batch Information				
Compound:	Dye	Dye	Dye	Dye
% of time used:	100%	100%	100%	100%
Ratio of Dye/Yarn (lb/lb):	0.4	0.4	0.4	0.4
Application Rate (wt% wet pickup):	40%	40%	40%	40%
Required Time/batch (hours):	—	—	—	—
Dye bath throughput (liter/hr)	54.43	54.43	54.43	54.43
A.3 Max Wet Usage Rate				
Max. Hourly Rate (lb/hr):	120	120	120	120
Max. Annual Rate (tpy):	526	526	526	526

Notes: Maximum Wet Usage Rate = (Ratio of Dye / Yarn) *(Maximum Production Rate)

1. Maximum hourly production rates are based on line capacity.

B. Batch Emission Calculations				
Superba Line 1 through 6 - Process Particulate Matter (PM) Emissions				
	Line SL1	Line SL2	Line SL3	Line SL4
Total Max. Annual Wet Usage Rate, i.e. solution used per line (tons, includes water)	526	526	526	526
% solids by weight	2%	2%	2%	2%
Annual tons of solids in dye solution	10.52	10.52	10.52	10.52
% of solids in evaporative loss ¹	0.10	0.10	0.10	0.10
Annual tons of solids in pre-dryer exhaust from the dye solution:	0.01052	0.01052	0.01052	0.01052
pounds/yr of evaporative loss solids	21.04	21.04	21.04	21.04
pounds/hr of evaporative loss solids	0.00240	0.00240	0.00240	0.00240

	PM (lb/hr)	PM (tpy)
Superba Yarn Dye Line 1	0.002	0.011
Superba Yarn Dye Line 2	0.002	0.011
Superba Yarn Dye Line 3	0.002	0.011
Superba Yarn Dye Line 4	0.002	0.011
Superba Yarn Dye Line 5	#REF!	#REF!
Superba Yarn Dye Line 6	#REF!	#REF!
Total PM Emissions	#REF!	#REF!

Note:

1. 99.99% of solids will be used to dye the yarn or remain in the dye bath. The overall majority of powered dyes and solid buffer materials will remain in solution or be fixed to the yarn substrate. A very small amount of solids will be in the evaporative losses.

2. The PM emissions will be released from the pre-dryer vents only. Wash waters will not contain appreciable amounts of solids. No lubricants will be applied before the final dryer.

**Table 3-11
Belmont Dye Line 1 Voc
Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application**

A. Process Unit Information	
Process Unit Description:	Belmont Line 1 - SPACE Dye Machine BL-1
Emission Unit I.D.	
A.1 Production Rate	
Max. Hourly Rate (lb yarn/hr) ¹ :	300
Max. Operating Schedule (hr/yr):	8,760
Max. Annual Rate (lb yarn/yr):	2,628,000
A.2 Batch Information	
Compound	Dye
% of time used:	100%
Ratio of Dye/Yarn (lb/lb):	0.4
Application Rate (wt% wet pickup):	40%
Required Time/batch (hours):	=
Dye bath throughput (liter/hr)	54.43
A.3 Max Wet Usage Rate	
Max. Hourly Rate (lb/hr):	120
Max. Annual Rate (tpy):	525.6
Notes: Maximum Wet usage Rate = (Ratio of Dye / Yarn) * (Maximum Production Rate)	
1. Maximum hourly production rates are based on line capacity.	

C. Batch Dye Emissions - VOC - Belmont BL1										
	Isolan Yellow	acid blue	telon blue	fouracid blue	lanaset blue	isolan bordeaux	Arroclean SDX (6)	Ultradoss 70DG (6)	total	
VOC lb/lb (1)	0.02	0.01	0.005	0.005	0.0101	0.0100	0.02	0.08		
Density (gm/liter) (1)	600	615	615	999.3524012	590	400	1099.287641	1099.287641		
Grams/hr (2)	32580	33395	33395	54265	32037	21720	59691	59691		
Pounds/hr (3)	71.84	73.64	73.64	119.66	70.64	47.89	131.62	131.62		
Max VOC Emissions										
Max lb/hr (4)	1.44	0.74	0.37	0.60	0.71	0.48	2.63	10.53	17.49448	
Max Annual TPY (5)	6.29	3.23	1.61	2.62	3.13	2.10	11.53	46.12	76.62583	

(1) - SDS

(2) - 54.3 liter/hr * density 54.3 liters/hr = 14.34 gal/hr

(3) - grms/hr / 453.5 gr/lb

(4) - lb/hr dye * voc lb/lb

(5) - (lb/hr * 8760 hrs/yr)/2000 lbs/ton

(6) Specific gravity/density given in lbs per gallon converted to g/l by multiplying lbs/gall by 119.826427 g/l. ex 9.14 lbs/gal * 119.826427

D. Lubricant Emissions			
	Usage lb/hr	VOC lb/lb	VOC TPY
Belmont BL1	30	0.0077	1.01178
30 lb/hr * VOC lb/lb * 8760/2000 = TPY			

Table 3-12

Belmont Dye Line 1 - HAPs Potential to Emit Calculations (EPN "BL1")

Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

A. Process Unit Information	
Process Unit Description:	Belmont Line 1 - Solid Dye Machines
Emission Unit I.D.	BL1
A.1 Production Rate	
Max. Hourly Rate (lb yarn/hr):	300
Max. Operating Schedule (hr/yr):	8,760
Max. Annual Rate (lb yarn/yr):	2,628,000
A.2 Batch Information	
Compound:	Lubricant
% of time used:	100
Ratio of Lube/Yarn (lb/lb):	10
A.3 Max Wet Usage Rate	
Max. Hourly Rate (lb/hr):	30
Max. Annual Rate (tpy)	262800

B. Maximum Individual HAP Potential to Emit

	Ethylene Oxide	1,4-Dioxane	Acetaldehyde	Propylene Oxide
HAP (lb / lb)	0.001	0.001	0.001	0.005
HAP (lb/hr)	0.03	0.03	0.03	0.15
HAP (pound/yr)	262.8	262.8	262.8	1314
HAP (ton per year)	0.1314	0.1314	0.1314	0.657

Total
All HAPs per Line (TPY) 1.0512 emitted as fugitives from spool rewinding
 0.24 lb/hr

Table 3-13

Belmont Dye Line 1 - PM Potential to Emit Calculations (EPN "BL1")
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

A. Process Unit Information	
Process Unit Description:	Belmont Line 1 - SPACE Dye Machine
Emission Unit I.D.	BL-1
A.1 Production Rate	
Max. Hourly Rate (lb yarn/hr) ¹ :	300
Max. Operating Schedule (hr/yr):	8,760
Max. Annual Rate (lb yarn/yr):	2,628,000
A.2 Batch Information	
Compound	Dye
% of time used:	100%
Ratio of Dye/Yarn (lb/lb):	0.4
Application Rate (wt% wet pickup):	40%
Required Time/batch (hours):	--
Dye bath throughput (liter/hr)	54.43
A.3 Max Wet Usage Rate	
Max. Hourly Rate (lb/hr):	120
Max. Annual Rate (tpy):	525.6
Notes: Maximum Wet usage Rate + (Ration of Dye / Yarn) *(Maximum Production Rate)	
1. Maximum hourly production rates are based on line capacity.	

B. Batch Emission Calculations for PM		
Belmont Line 1 - Process Particulate Matter (PM) Emissions		
	Line BL1	
Total Max. Annual Wet Usage Rate, i.e. solution used per line (tons, includes water)	525.6	
% solids by weight	2	
Annual tons of solids in dye solution	10.512	
% of solids in evaporative loss ¹	5	
Annual tons of solids in pre-dryer exhaust from the dye solution	0.5256	
pounds/yr of evaporative loss solids	1051.2	
pounds/hr of evaporative loss solids	0.12	
	PM (lb/hr)	PM (tpy)
Belmont Yarn Dye Line 1	0.12	0.5256
Total PM Emissions		

Note:

- 99.99% of solids will be used to dye the yarn or remain in the dye bath. The overall majority of powered dyes and solid buffer materials will remain in solution or be fixed to the yarn substrate. A very small amount of solids will be released from the pre-dryer vents only. Wash waters will not contain appreciable amounts of solids. No lubricants will be applied before the final dryer.

Table 3-14
 Latex Range Topical and Mix Data (EPN "LPCR-1")
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, Va/ Title V Renewal Application

Process Unit Information

Line Speed (fpm)	125	Process Data
Carpet Width (ft)	6	Process Data
Latex Add-on (oz/yd ²)	24	Process Data
Total Latex Mix Weight (lbs)	45,987.5	Process Data
Topicals Add-on (oz/yd ²)	3	Process Data
Carpet Production Rate (yd ² /hr):	5,000	Line Speed (ft/min) * carpet width (ft) * 60 min/hr / 9ft ² /yd ²
Carpet Production Rate (yd ² /yr):	43,800,000	Carpet production rate (yd ² /hr) * 8760 hr/yr
Latex mix Usage (lb/yr):	65,700,000	Carpet Production Rate (yd ² /yr)*Latex Add-on (oz/yd ²) / 16 oz/lb
Latex Mixes per year:	1,428.63	Latex Mix Usage (lb/yr)/Total Latex Weight (Lb)
Topical Mix Usage (lb/yr):	8,212,500	Carpet Prod. Rate (yd ² /yr)*Topical Add-on (oz/yd ²)/ 16 oz/lb

Latex Mix Formula Used on Latex Range

Ingredients	Percent of Mix	Total in Mix (lb)	Comments
Foundations 807	45.37754825	20868	Contains VOC and Haps
Carbon Black	0.027181299	12.5	No VOCs or HAPs
JR PI High Calcium Filler	53.60369666	24651	No VOCs or HAPs
Stanfax 238	0.59581408	274	No VOCs or HAPs
Paragum 277	0.395759717	182	Contains VOC
Total	100	45987.5	

Topical Mix Formulas Used on Latex Range

Mohawk Mix (used 90% of time)		4347.8	mixes/yr	Topical Mix Use (lb/yr)/ batch size 1700 lb * 90%
Ingredients	Percent Mix	Total in Mix (lb)	Comments	
Water	82.7	1405.9	No VOC or HAPs	
Ultrafoam NF-40	0.6	10.2	No VOC or HAPs	
Antistat AS-1747	3.6	61.2	Contains HAPs (Phosphorous)	
Arroshield SR	7.5	127.5	No VOC or HAPs	
Sunlife XL-20	5.6	95.2	No VOC or HAPs	
Total	100	1700		

Duratech Mix (used 10% of time)		483.1		Topical Mix use (lb/yr) / Batch size 1700 lb * 10%
Ingredients	Percent mix	Total in Mix (lb)	Comments	
Water	91.5	1555.5	No VOC or HAPs	
A-403	6	102	Contains VOC	
Ultrafoam NF-40	2.5	42.5	No VOC or HAPs	
Total	100	1700		

Table 3-15
Latex Range - VOC Emission Calculations from Coatings (EPN "LPCR-1")
Mohawk Industries, Ins. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

VOC in Latex Mix Formula

Ingredients	Amount in Mix (lbs) ¹	Percent of Mix ²	Percent VOCs ¹	VOCs per Mix (Lbs) ³	VOCs (TPY) ⁴
Latex Base - Foundations 807	20868	45.378	0.05	10.434	7.45316271
Carbon Black	12.5	0.027	0	0	0
JR PI High Calcium Filler	24651	53.604	0	0	0
Stanfax 238	274	0.596	0	0	0
Paragum thickener	182	0.396	0.05	0.091	0.065002665
Total	45987.5	100	0.1	45.9875	7.518165375

Speciated VOC in Latex Mix Formula

Ingredient	Speciated VOC	wt%	VOCs per Mix (Lbs) ⁵	VOCs (TPY) ⁶
Foundations	residual monomers and contaminants ³⁰	0.05	10.434	7.45316271
Paragum thickener	Methanol	0.05	0.091	0.065002665

VOCs in Topical Mix Formulas

Topical	Ingredients	Total in Mix (lbs) ¹	Percent in Mix ⁷	Ingredient % VOC ¹	VOC (lb/mix) ⁸	VOCs (TPY) ⁹
Mohawk mix	Water	1405.9	82.7	0	0	0
	Ultrafoam NF-40	10.2	0.6	0	0	0
	Antistat AS-1747	61.2	3.6	0	0	0
	Arroshield SR	127.5	7.5	0.01	0.01275	0.027717225
	Sunlife XL-20	95.2	5.6	0	0	0
Duratech mix	Water	1555.5	91.5	0	0	0
	A-403	102	6	0.1	0.102	0.4106
	Ultrafoam NF-40	42.5	2.5	0	0	0

Notes:

- Process Formulation
- Percent of Mix = Amount in Mix / Total of Mix
 Sample Calculation: Latex Base
 $20868 / 45987.5 = 45.38 \%$
- VOC per Mix = Amount in Mix * Percent VOCs / 100
 Sample Calculation: Latex Base
 $20868 * 0.05 / 100 = 10.434 \text{ lbs}$
- VOCs (TPY) = VOCs per Mix * Number of Mixes a year / 2000 lb/ton
 Sample Calculation: latex base
 $10.434 * 1428.63 / 2000 = 7.453163 \text{ TPY}$
- VOCs = % in Mix / 100 * Amount in Mix
 Sample Calculation: Methanol
 $0.001 / 100 * 182 = 0.00182 \text{ lbs}$
- VOCs = VOCs per Mix * Latex Mixes per year / 2000 lb/ton
 Sample Calculation: Methanol
 $0.019 * 1428.63 / 2000 = 0.065 \text{ TPY}$
- Percent in Mix = lbs Ingredient in Mix / Total Weight of Mix * 100
 Sample Calculation: Antistat AS1747 in Mohawk Mix
 $61.2 / (1405.9 + 10.2 + 61.2 + 127.5 + 95.2) * 100 = 3.6 \%$
- VOC (lb/mix) = Total lb VOC in Mix * Ingredient % VOC / 100
 Sample Calculation: Arroshield SR in Mohawk Mix
 $127.5 * 0.01 / 100 = 0.01275 \text{ lb/mix}$
- VOCs (TPY) = VOC (lb/mix) * Number of Mixes per year / 2000
 Sample Calculation: Arroshield SR in Mohawk Mix
 $0.01275 * 4347.8 / 2000 = 0.02772 \text{ TPY}$

Table 3-15 cont'd
 Latex Range - VOC Emission Calculations from Coatings (EPN "LPCR-1")
 Mohawk Industries, Ins. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

Mohawk - Glasgow VA - Natural Gas Dryer for Latex PreCoat Range oven

LPCO				PM	PM ₁₀	SO ₂	NO _x	CO	VOC	CH ₄	C02	
10 ⁶ BTU / Hr [Size]:	2.5	BTU/SCF:	1000	Lb/10 ⁶ SCF:	7.6	7.6	0.6	100	84	5.5	2.3	120000
Hours/Year:	6000	% Sulfur:	-	Lb/Hr:	0.0190	0.0190	0.0015	0.2500	0.2100	0.0138	0.0058	300.0000
Source: AP-42 Fifth Edition, Tables 1.4-1,-2, 7/98 Update				TPY:	0.06	0.06	0.00	0.75	0.63	0.04	0.02	900.00

Tons Per Year Maximum Emissions							
PM	PM ₁₀	SO ₂	NO _x	CO	VOC	CH ₄	C02
0.228	0.228	0.018	3	2.52	0.165	0.069	3600

four 2.5 mmBTU/hr Burners

Total VOC + NG
 8.12
 1.85422

Table 3-16

Latex Range - HAP Emission Calculations from Coatings (EPN "LPCR-1")
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/ Title V Renewal Application

HAP in Latex Mix Formula

Ingredients	Amount in Mix	Percent of Mix ²	Percent HAP ¹	HAPs per Mix (lbs) ³	HAPs (TPY) ⁴
Latex Base - Foundations 807	20868	45.37755	0.0014	0.292152	0.208689
Carbon Black	12.5	0.027181	0	0	0
JR PI High Calcium Filler	24651	53.6037	0	0	0
Stanfax 238	274	0.595814	0	0	0
Paragum thickener	182	0.39576	0	0	0
Total	45987.5	100	0.0014	0.292152	0.208689

Speciated HAP an Latex Formula

Ingredients	Speciated HAPs	wt%	HAPs per mix (lbs) ⁵	HAPs (lb/hr) ⁶	HAPs (TPY) ⁶
Latex Base - Foundations 807	Styrene	0.0009	0.187812	3.06E-02	1.34E-01
	4-vinylcyclohexene	0.0001	0.020868	3.40E-03	1.49E-02
	alkylbenzenes	0.0001	0.020868	3.40E-03	1.49E-02
	Methyl methacrylate	0.0003	0.062604	1.02E-02	4.47E-02
Total HAPs in Latex Mix				4.76E-02	2.09E-01

HAPs in Topical Mix Formulas

Ingredients	Total in Mix (lbs) ¹	Percent in Mix ⁷	Ingredient % HAP ¹	HAP (lb/mix) ⁸	HAPs (lb/hr) ⁹	HAPs (TPY) ⁹
Mohawk Mix						
Water	1405.9	82.7	0	0	0	0
Ultrafoam NF-40	10.2	0.6	0	0	0	0
Antistat AS-1747	61.2	3.6	0	0	0	0
Arroshield SR	127.5	7.5	0	0	0	0
Sunlife XL-20	95.2	5.6	0	0	0	0
Duratech Mix						
Water	1555.5	91.5	0	0	0	0
A-403	102	6	0	0	0	0
Ultrafoam NF-40	42.5	2.5	0	0	0	0

Notes:

- Process Formulation
- Percent of Mix = Amount in Mix / Total of Mix
 Sample Calculation: Latex Base
 $20868 / 45987.5 = 45.38\%$
- HAP per Mix = Amount in Mix * Percent HAPs / 100
 Sample Calculation: Latex Base
 $20868 * 0.0014 / 100 = 0.292 \text{ lbs}$
- HAPs (TPY) = HAPs per Mix * Number of Mixes a year / 2000 lb/ton
 Sample Calculation: Latex Base
 $0.292 * 1428.63 / 2000 = 0.209 \text{ TPY}$
- HAPs = % in Mix / 100 * Amount in Mix
 Sample Calculation: Styrene
 $0.0009 / 100 * 20868 = 0.188 \text{ lbs}$
- HAPs = HAPs per Mix * Latex Mixes per year / 2000 lb/ton
 Sample Calculation: Styrene
 $0.188 * 1428.63 / 2000 = 0.134 \text{ TPY}$
 $0.134 / 2000 \text{ lb/ton} * 8760 \text{ hours / yr} = 0.0306 \text{ lb/hr}$
- Percent in Mix = lbs Ingredient in Mix / Total Weight of Mix * 100
 Sample Calculation: Antistat AS1747 in Mohawk Mix
 $61.2 / (1405.9 + 10.2 + 61.2 + 127.5 + 95.2) * 100 = 3.6\%$
- HAP (lb/mix) = Total lb HAP in Mix * Ingredient % HAP / 100
 Sample Calculation: Arroshield SR in Mohawk Mix
 $0 * 0.01 / 100 = 0.0 \text{ lb/mix}$
- JHAPs (TPY) = HAPs (lb/mix) * Number of Mixes per year / 2000
 Sample Calculation: Arroshield SR in Mohawk Mix
 $0 * 4347.8 / 2000 = 0.0 \text{ TPY}$
 $0.0 / 2000 \text{ lb/ton} * 8760 \text{ hours / yr} = 0.0 \text{ lb/hr}$

**Mohawk has moved to lower HAP containing materials since 2011

Table 3-17
 Latex Range - PM Emission Calculations from Coatings (EPN "LPCR-1")
 Mohawk Industries, Inc. - Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

Dust House Filter Data

Rated efficiency (%)	99.90	
Guaranteed Efficiency (%)	99.50	
Uncontrolled Emissions (%)	0.5	= (100 - 99.5)
PM Emission Factor:	0.72	lb PM per ton filler
PM ₁₀ Emission Factor:	0.46	lb PM ₁₀ per ton filler

PM and PM10 emission factors are from EPA WebFIRE database with Scc 30501107

PM Emissions		
Annual:		
$(34,807,860 \text{ lb Filler/yr}) / (2000 \text{ lb/ton}) \times 8 (1-0.995) \% \text{ Uncontrolled Emissions} \times (0.72 \text{ PM per ton filler}) =$	62.7	lb PM/yr
	0.03	TPY PM
Hourly		
$(60,000 \text{ lb Filler/hr}) / (2000 \text{ lb/ton}) \times 91-0.995 \text{ Uncontrolled Emissions} \times (0.72 \text{ lb PM per ton filler}) =$	0.108	lb PM/hr
PM10 Emissions		
Annual:		
$(34,807,860 \text{ lb Filler/yr}) / (2000 \text{ lb/ton}) \times (1-0.995) \text{ Uncontrolled Emissions} \times (0.46 \text{ lb PM}_{10} \text{ per ton filler}) =$	40.03	lb PM ₁₀ /yr
	0.02	TPY PM ₁₀
	+ NG =	0.228
		0.248
Hourly:		
$(60,000 \text{ lb Filler/hr}) / (2000 \text{ lb/ton}) \times (1-0.995) \text{ Uncontrolled Emissions} \times (0.46 \text{ lb PM}_{10} \text{ per ton filler}) =$	0.069	lb PM ₁₀ /hr
	+ NG =	0.076
		0.145

Table 3-18
PVC Tile Line Add-On Emission Calculations (EPN "PVC1")
Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

A. Process Unit Information						
A.1 Production Rate						
Maximum Production Rate ¹ :	2400 yd ² /hr	This rate used for typical 60 oz main coat.				
	1552 yd ² /hr	This rate used for heavy walk off mats				
Maximum operating schedule:	8760 hr/yr					
Maximum annual rate:	21,024,000 yd ² /yr					
A.2 Batch Information						
Compound	Percent Usage	Solid Content	Hourly Ratio of Coating / Carpet	Annual Ratio of Coating / Carpet	Max Usage Rate	
			(lb/yd ² - dry)	(lb/yd ² - dry)	(lb/hr)	(TPY)
PVC Batch	100%	100.00%	8.125	5.25	19500	55188

Notes: Maximum Wet Usage Rate = (Ratio of Coating/Carpet)/(Solid Content)*(Maximum Production Rate)

1. Based on a range speed up to 60 fpm by 6 ft wide at 85 oz backing and maximum 45 fpm at 130 oz backing (to allow drying time).

2. Identical Usage Rates occur when 60 fpm at 84 oz backing and when 130 oz are applied at 38.8 fpm. But worst case hourly is at 130 oz application rate.

B. PVC Batch Main Coat Process Emissions (typical formulation)								
PVC Batch	Eastman 168	Soybeen Lecithin	Resin 138	Resin 260	Carbon Black	Lime	Flyash 20A	Total Plastisol
Batch Weights - lb	2393	38	1900	800	25	50	8467	13673
Batch % Composition	17.50%	0.28%	13.90%	5.85%	0.18%	0.37%	61.92%	100.00%
VOC % by Weight	0.00012%	0.00%	0.000000011%	0.00000345%	0.00%	0.000%	0.000%	
Solids % by Weight	99.5	100	99.9	100	99.5	100	100	
Transfer Efficiency %	100%	100%	100%	100%	100%	100%	100%	
Max Usage Rates:								
Max. Hourly: (lb/hr)	3412.8209	54.194398	2709.719886	1140.9347	35.654209	71.308418	12075.368	19500
Max. Daily: (ton/day)	40.953851	0.6503328	32.51663863	13.691216	0.4278505	0.855701	144.90441	234
Max Annual: (tpy)	358755.73	5696.9151	284845.7544	119935.05	3747.9705	7495.9409	1269362.6	2049840
Max VOC Emissions:								
Max. Hourly: (lb/hr)	0.0042319	-	2.98069E-07	3.936E-05	-	-	-	0.004272
Max. Annual: (tpy)	0.0185357	-	1.30554E-06	0.0001724	-	-	-	0.018709
Max. PM Emissions:								
Max. Hourly: (lb/hr)	0.0941939	0.0014958	0.074788269	0.0314898	0.0009841	0.0019681	0.3332801	0.5382
Max Annual: (tpy)	0.4125691	0.0065515	0.327572618	0.1379253	0.0043102	0.0086203	1.459767	2.357316

Note: This is a typical batch formulation for emission estimation purposes

Note: PM Emission Rate = (Maximum Wet Usage Rate-hourly or annual) * (0.00138 lb PM/lb batch) *(0.02 percent of loss due to transfer inefficiency)

Source of PM emission factor is historical. Coalescing Filter assumes a 98% capture.

Table 3-18 Cont'd

PVC Tile Line Add-On Emission Calculations (EPN "PVC1")
Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

C. Maximum Emissions for PVC-1	
Pollutant	Total
Maximum VOC Emissions	
Max Hourly: (lb/hr)	0.0043
Max Annual (tpy)	0.02
Maximum PM Emissions	
Max Hourly: (lb/hr)	0.54
Max Annual (tpy)	2.36

	PTY	hrlyj
PM + NG	2.50	0.5697452
VOC + NG	0.12	0.0271003

Note: PM Emission Rate = (Maximum Wet Usage Rate-hourly or annual) * (0.00138 lb PM/lb batch) *(0.02 percent of loss due to transfer inefficiency)
Source of PM emission factor is historical. Coalescing Filter assumes a 98% capture.

Net: gas emissions				PM	PM ₁₀	SO ₂	NO _x	CO	VOC	CH ₄	CO ₂	
BTU / Hr [S]	6.06	BTU/SCF:	1000	Lb/10 ³ SCF:	7.6	7.6	0.6	100	84	5.5	2.3	120000
Hours/Year:	8000	% Sulfur:	-	Lb/Hr:	0.0461	0.0461	0.0036	0.6060	0.5080	0.0339	0.0139	727.2000
Source: AP-42 Fifth Edition, Tables 1.4-1,-2, 7/88 Update				TPY:	0.14	0.14	0.01	1.82	1.53	0.10	0.04	2181.60

Table 3-19
GHG Emissions from Combustion Units
Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

I. . .

1. Equation C-1 from §98.33, $CO_2 = \text{Fuel} * \text{HHV} * \text{EF}$

where: Fuel * HHV is the boiler plate firing rate for the combustion source
 EF is the fuel specific default CO_2 emission factor from Table C-1

2. Equation C-8 From §98.33, CH_4 or $N_2O = \text{Fuel} * \text{HHV} * \text{EF}$

Fuel * HHV is the boiler plate firing rate for the combustion source
 EF is the fuel specific default CH_4 or N_2O emission factor from Table C-2

3. Emissions calculations are based on the assumption that equipment can operate 8760 hours per year

II. Calculation Variables¹:

	Distillate Fuel Oil	Natural Gas	Data Source
Emission Factor, CO_2	73.96	53.02	kg CO_2 /MMBtu, Table C-1
Emission Factor, CH_4	0.003	0.001	kg CH_4 /MMBtu, Table C-2
Emission Factor, N_2O	0.0006	0.0001	kg N_2O /MMBtu, Table C-2
Heating Value (HHV)	0.138	1,028	#2 Fuel oil, Natural Gas, MMBtu/scf
Permit Limitations	5000	8760	Current Title V Permit hours limitation

	Distillate Fuel Oil	Natural Gas	
Combined Boiler 5 and Boiler 6	192	192	MMBtu/yr

III. Emissions Calculations

Unit Type	Emission Point	Unit Description	Fuel Type ²	Firing Rate MMBtu/hr	Firing Rate MMBtu/yr	Emissions ³				
						CO_2 tonnes/yr	CH_4 tonnes/yr	N_2O tonnes/yr	CO_2e_2 tonnes/yr	CO_2e_2 tons/yr
Boiler	B5	Boiler 5	NG	120	1051200	55,735	1.05	0.11	55,789.29	61,497.16
Boiler	B6	Boiler 6	NG	72	630720	33,441	0.63	0.06	33,473.57	36,898.30
Boiler	B5	Boiler 5	FO - 2b	120	600000	44,376	1.80	0.36	44,525.40	49,080.85
Boiler	B6	Boiler 6	FO - 2b	72	360000	26,626	1.08	0.22	26,715.24	29,448.51
oven	LPCR-1	Precoat Oven	NG	10	87,600	4,644.55	0.09	0.01	4,649.11	5,124.76
Process Heater	PVC-1	PVC Oven	a	1.62	14,191	752.417424	1.42E-02	1.42E-03	753.16	830.21
Process Heater	PVC-1	PVC Oven	a	3.25	28,470	1509.4794	2.85E-02	2.85E-03	1,510.96	1,665.55
Process Heater	PVC-1	PVC Singer	a	0.44	3,854	204.360288	3.85E-03	3.85E-04	204.56	225.49
Process Heater	PVC-1	Self-lock tile oven	a	0.75	6,570	348.3414	6.57E-03	6.57E-04	348.68	384.36

1. The representations reflect typical operating parameters, but may not represent actual process emissions.

2. a. This source can fire natural gas only.

2. b. This source can fire natural gas or Distillate Fuel Oil. Since Distillate Fuel Oil has higher emission factors, emissions for these units are based on #2 fuel oil.

3. For sources that can only burn natural gas, the natural gas emission factors are used. For sources that can fire natural gas or Distillate Fuel Oil, the higher emission factor (Distillate Fuel Oil) is used up to the permitted consumption. Sample Calculation, Boiler 5, CO_2 :

4. $CO_2e = \sum (\text{mass of a GHG species}) * (\text{global warming potential (GWP)})$

Species	CO_2	CH_4	N_2O
GWP		1	21
			310

Table 3-20
Insignificant, Ash Silo
Mohawk Industries, Inc. - Lees Carpet Division/Glasgow, VA/Title V Renewal Application

Process Unit Information

Description	Variable	Value	Units	Notes
Fly ash Use	Ca	18420	TPY	Process Limitation
Coal Ash/Fly Ash Content	Ash	7.0	%	Conservative Process Knowledge, assume all ash is processed through silo even though only fly ash is routed to silo
Ash Processed	Asha	1289	TPY	$Ca * Ash / 100$
Emission Factor	EF	110.0	lb / ton processed	AP42, Table 11.8-1
Uncontrolled Emissions	EmUa	70.9	TPY	$Asha * EF / 2000 <lb/ton>$
Control Efficiency, enclosed movement	CEw	85.0	%	TCEQ RG 058, Table 7
Control Efficiency, Baghouse	CEb	99	%	Manufacturer's Data
Controlled Emissions	Ema	0.11	TPY	$EmUa * (1-CEw/100) * (1-CEb/100)$

Table - 21
Insignificant Cleaning Activities
Aladdin Manufacturing/Glasgow, VA/Title V Renewal Application

Equipment Description	Annual Solvent Usage (gal/yr)	Annual Solvent Loss (gal/yr) ³	Solvent Density (lb/gal)	Annual VOC Emission Rate (tpy)
Non-aqueous Parts Washer	138.50	1.39	7.90	0.005

Notes:

1. Emissions are controlled through the use of a cover, enclosed parts drainage, solid fluid spray, proper use of equipment, and waste solvent reclamation.
2. Solvent density is based on a specific gravity from Safety Kleen (7.9 lb/gal from MSDS)
3. Assumed that total annual solvent loss to 1% of solvent brought to the site, from Safety Kleen records.

Sample Calculation: Annual Solvent Usage <gal/yr> * Solvent Density <lb/gal> / 2000 <lb/ton>

$$\text{Emissions: } 1.385 * 7.9 / 2000 = 0.005 \text{ tpy}$$

Equipment Description	Annual Solvent Usage (gal/yr) (*1)	Annual Solvent Loss (gal/yr) (*2)	Solvent Density (lb/gal)	VOC Content weigh % (*3)	Annual VOC Emission Rate (tpy) (*4)
Arroclean SDX used to clean Space Dye lines	872.03	872.03	9.17	32.400	1.296

*1 Maximum expected cleaning usage based on process knowledge: 8000 lbs per year / specific gravity*8.34 = gallons use (specific gravity

' based on SDS is >1 so assume 1.1)

*2 assume 100% loss to the air as no other means to measure. Some will go down the drain but also assume that will evaporate off as well

*3 - VOC from manufacturer data - supplied on SDS and COC evaluation sheet

*4 = ((Max usage in lbs*VOC content*0.01))/2000

Attachment J

EPA Comments and DEQ Responses

EPA Comments on Proposed Title V Renewal, VRO 80269

Aladdin Manufacturing Corporation, Glasgow, VA, 51-163-00001

April 11, 2017

I. PERMIT SUMMARY:

Aladdin Manufacturing Corporation operates a nylon carpet manufacturing facility. Activities at the facility include fuel burning, yarn dyeing, yarn processing, and carpet backing. Additional equipment includes storage silos, feed hoppers, storage tanks, and mixing operations. The facility is a PSD synthetic minor source, and a synthetic minor source of HAPs. It is located two kilometers from a federally designated Class I area.

II. COMMENTS:

A. General:

Because comment #1 is considered significant, the we request that this permit be processed sequentially, i.e., a revised proposed permit be submitted to EPA with a Response to Comments. The day EPA receives the revised proposed permit would be Day 1 of EPA's 45-day review.

B. Permit:

1. Please ensure limits are practically enforceable and compliance is demonstrated within the permit. For instance:

- a. Conditions 6 and 7: Please include periodic stack testing or other compliance demonstration to ensure compliance with the limits. Associated reporting and recordkeeping should also be included.

The DEQ agrees and has added stack testing for NOx and CO once per permit term for each boiler (B5 and B6), with the associated recordkeeping and reporting requirements. Please refer to the proposed Title V permit for incorporation of the changes and the Statement of Basis for a discussion of the stack testing requirements.

For all other criteria pollutants, please see the revised Statement of Basis for a discussion of the alternative compliance demonstrations.

- b. Condition 33, 34: Please explain how the control efficiency of the coalescing filter (CEcf) is determined. Please consider adding this numeric value to the permit and a requirement to test that the value is met.

The control efficiency is assumed to be 98% as a conservative estimate based on manufacturer data submitted with the initial permit action. The manufacturer indicated a 1-2% loss was anticipated, but losses could be reduced to less than 1% through proper operation and temperature control. The facility tested the unit in 1991 / 1992, confirming the manufacturer's estimate. The testing indicated that 0.138 pounds of material were emitted for every 100 pounds of

plastisol used (effectively a 99.998% control efficiency). The conservative estimate of 98% has been included in the permit conditions (see Conditions 34 and 35 of the revised draft). Additionally, the manufacturer was contacted by the facility on April 17, 2017; they provided control efficiencies approaching 100% for particulate >100 um, and approaching 99.5% for particulate <3 um. (See the attached PDF).

The DEQ does not believe stack testing is warranted in this case given the past stack testing, and continued assurances from the manufacturer.

As provided in the Statement of Basis, visible emission have been selected as the the indicator for proper operation and maintenance of the coalescing filter. The control equipment will limit the amount of particulates that are emitted thereby limiting visible emissions. Proper operation in accordance with the manufacturer's recommendations, along with the requirement for visible emission evaluations provides adequate means of demonstrating continuous compliance with the emission limitations in the permit.

- c. Condition 51: this condition attempts to limits the HAPs to synthetic minor levels. The permit appears to contemplate that the facility will merely demonstrate that the limit has not been exceeded at the end of each month. This is a method of emissions monitoring, not a restriction on potential emissions. We view the emission limitation as a blanket emission limit without operational restrictions. As required in 40 C.F.R. § 70.6(a)(1) and 9VAC5-80-110.B.1, the permit must include operational requirements and limitations that assure compliance. The PTE of each individual HAP is each less than 10 tons per year, and the PTE of all combined HAPs is less than 25 tons per year. These conditions are no longer required and have been removed from the draft permit. The PTE calculations for HAPs have been included as an attachment to the Statement of Basis.
- d. TE1-RTD1, TE1-RTD2, TE1-RTD3, TE1-RTD4, TE1-T1, TE1-T2: these units are all controlled by fabric filters. Please explain how proper operation of the fabric filters is ensured. The permit provides visible emissions limit (condition 29), but no requirement to monitor the visible emissions. Additionally, the permit requires differential pressure readings across the fabric filters (condition 37), but no acceptable range for the pressure.

Monitoring: The DEQ included the fabric filters in the Visible Emission Monitoring condition (see Condition 37 in the revised draft). The condition already requires recordkeeping for all visible emission evaluations (see Condition 39.f in the revised draft).

Differential pressure range: These are all passive filters; however the permit requires the differential pressure drop to be measured across each filter. The device used to measure the differential pressure "shall be installed, calibrated,

and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer’s written requirements or recommendations,” which would include the acceptable range for each filter (see Condition 38 of the revised draft). The facility indicated that 6 inches WC is considered high and action is required at that range, per the manufacturer’s recommendation.

C. Citations/ References:

2. Condition 29.c.4: Please explain what is “Pellet 2.” This unit does not appear elsewhere in the permit.

Pellet 2 is a shutdown pellet silo – it has been removed from the permit (shutdown in 2012).

3. Condition 51: Attachment B is referenced in this condition- please include the attachment. Or if attachment A is intended, please modify the condition.

This is no longer required. See 1.c above.

Prepared by
Mary Cate Opila
Opila.marycate@epa.gov
215-814-2041
EPA, Region 3
Office of Permits and State Programs 3AP10



CECO efficiency.pdf

Rebecca Bolden

From: Tim Daniels
Sent: Monday, April 17, 2017 2:11 PM
To: Rebecca Bolden
Subject: FW: Mohawk Glasgow - CECO Coalescing Filter Efficiency

Becca,

Is this okay or do you need official documentation?

Tim

From: Jeff Adams [mailto:jadams@OneCECO.com]
Sent: Monday, April 17, 2017 1:37 PM
To: Damion Adams; Matt Lee; Tim Daniels
Cc: Craig Devoll; Gregory Rowe; Joseph McManus
Subject: RE: Mohawk Glasgow - CECO Coalescing Filter Efficiency

Tim,

The filter elements provided for this System, CECO PN 2508132, are high efficiency, fiber bed filters. The design Efficiency would be as follows:

- Removal efficiency approaches 100% by weight for all particles > 3 microns.
- Removal Efficiency approaches 99.5% by weight for all particles < 3 microns.

Please contact me with any questions.

Jeff Adams | Project Engineer
CECO Filters | **NASDAQ: CECE**
700 Emlen Way | Telford, PA 18969
Phone: 610.825.8585 X402 | E-mail: jadams@OneCECO.com



www.cecoenviro.com

From: Damion Adams
Sent: Monday, April 17, 2017 9:42 AM
To: Matt Lee
Cc: Craig Devoll; Jeff Adams; Gregory Rowe; Joseph McManus
Subject: FW: Mohawk Glasgow - CECO Coalescing Filter Efficiency

Matt, Can someone provide Tim from Mohawk with the information he requested below?

Respectfully,
Damion Adams
(316)253-7233

From: Tim Daniels [mailto:Tim_Daniels@mohawkind.com]
Sent: Friday, April 14, 2017 3:20 PM
To: Damion Adams
Cc: Rebecca Bolden
Subject: Mohawk Glasgow - CECO Coalescing Filter Efficiency

Damion,

Corporate Environmental is working on updated Title V permit and need the performance efficiency of the CECO filter system at Glasgow.

Would you send this to me by Monday afternoon.

Thanks

Tim Daniels
Sr. Regional Process Engineer
Glasgow Plant
Office: 540-258-7334

Cell: 540-529-6972
Ext 87334